

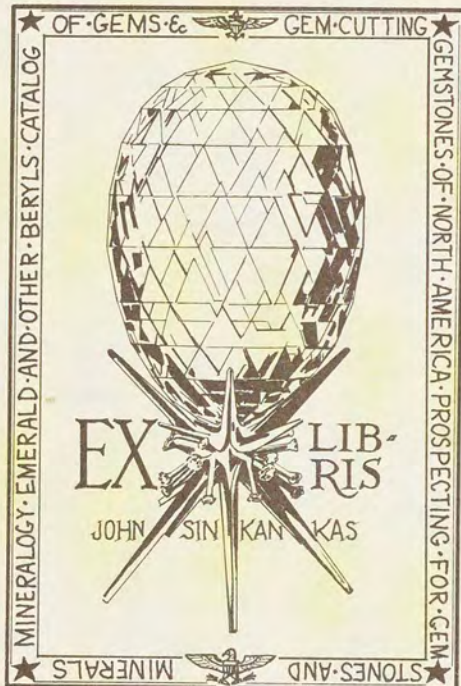
A. E. FOOTE'S
CATALOGUE
OF MINERALS

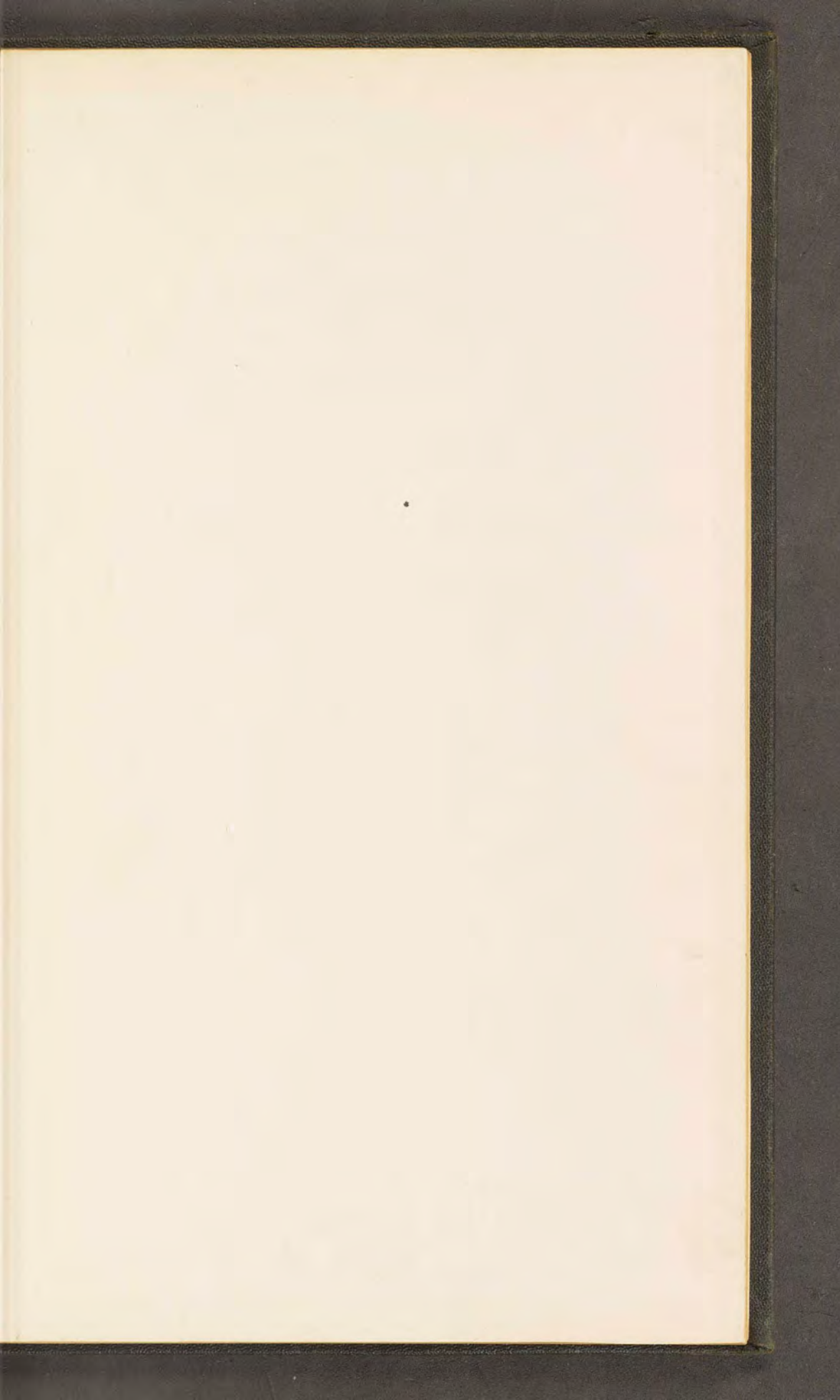
100

Catcat

Mineral

4/00





ISL
RTL009962

*Adv. J. Sinkankas USN
Nov 1954*

CATALOGUE OF MINERALS.

A. E. FOOTE,

No. 1223 Belmont Ave., Philadelphia, Pa.

EIGHTH EDITION.



PROF. A. WINCHELL, Professor in Geology in Michigan University, formerly Vice President of the Am. A. A. Science and Chancellor of Syracuse University, says:—"Your catalogue is perfectly unique and answers equally for catalogue and manual of Mineralogy."

Commencing in business in 1876, I received the only award and medal for "collections of minerals" that was given to any American at the Centennial; and have since! received Awards, Diplomas and Medals at New Orleans, London, Cincinnati and other cities. I believe I have the largest stock of Minerals in the world; and I have also the largest stock of Scientific, Medical, Agricultural and Horticultural books.

1889.

INDEX.

	PAGE		PAGE
Acidic and Basic Feldspars,	57	Lime Soda Feldspar,	57
Adularia,	59	Lithology, Book List on,	95, 96, 97
Agate, Moss, Fortification, etc.,	66, 67	Love's Arrow, Fleche d'Amour,	60
Agriculture, Collections of Minerals used in,	68	Loxoclaste,	58
Albite,	58	Malachite,	4
Amazon Stone, illustrated,	59	" pseudomorph after Azurite,	4
Amethyst,	5	Mazapilite,	4, 53
Anorthite,	57	Medicines, Collections of Minerals used in Manu-	68
Apophyllite,	5	facturing,	60
" Rose colored,	5	Menaccanite,	69, 70
Argentite,	4	Metalurgy, Book List on,	5
Arizona Minerals,	83	Meteorites,	79, 80
Assaying, Book List on,	65	" Book List on,	4
Asteriated Quartz,	4	Mexican Minerals,	5
Azurite,	4	" Onyx,	58, 59
" pseudomorph,	65	Microcline,	66
Basanite,	86	Milky Quartz,	6
Biography, Book List on,	59	Mineralogical Books Wanted,	68
Bloodstone,	83	Minerals by the Pound,	32
Blowpipe, Analysis, Book List on,	68	" for the Microscope,	3
and other Minerals by the pound,	14	" New Arrivals,	22
Book Abbreviations,	15 to 22, 69 to 97	Mining and Mining Localities, Book List on,	19, 20, 21, 22
Book Lists on Mineralogy, etc.,	6	Naturalists' Leisure Hour, Specimen page,	3
" Where found,	66	Obsidian,	5
Brazilian Pebble,	4	Of General Interest,	1, 2
Brochantite,	89	Oligoclase,	58
Cacoclasite, illustrated,	65	Opal,	4
Cairngorm Stone,	5	" Agate,	5
Calcite, Twin,	3	" Harlequin,	5
California Minerals,	5	" Milky,	5
Cassiterite,	66	Ornamental Arts, Collection of Minerals used in the,	68
Catseye,	67	Ores and Metallic Minerals, Collections of,	68
Chalcedony,	65	Orthoclase, illustrated,	58, 59
Chert,	68	Paramorph of Rutile after Arkansite, illustrated,	61
Chemical Manufacture, Collections of Minerals used	68	Pearlite,	5
for,	4	Perovskite,	60
Chrysocolla,	67	Petrified Wood,	67
Chrysoprase,	65	Plasma,	48
Citrine,	55	Poem. A Fire Opal,	3
Classification according to Crystalline Form,	90 to 95	Polybasite,	4
Coal and Coal Oil, Book List on,	9, 10, 11, 12, 68	Porcelain Jasper,	67
Collections of Minerals,	52, 53	Porphyry,	57
Color, Table of,	78	Price List of Collections,	13
Copper, Book List on,	68	" of Specimens,	23 to 32
" Minerals, Collections of,	4	Pseudomorphs, Price List,	32
Covelite,	65	Pyargyrite,	65, 66, 67
Crystal, illustrated,	8, 9	Quartz, illustrated,	5
Crystallization,	9	" containing bubbles,	5
Crystallographic Series, Collections of,	86	" pseudomorph,	5
Crystallography, Book List on,	4	Rose Quartz,	65
Cuprite,	5	Rutile,	63, 64
Cuprodescloisite,	4	Sagenitic Quartz,	66
Descloisite,	4	Sanidin,	45
Dumortierite,	4	Sardonyx,	67
Embolite, Silver Chlorobromite,	62	Scientific and Valuable Books,	7
European Minerals,	5, 6	Sets of Journals,	7
Extra Rare and Valuable Books, Mineralogy,	12	Shipping Directions,	2
Feldspar, full account, illustrated,	57, 58, 59	Silver, Book List on,	75, 76, 77
Felsite,	66	Silicious Sinter,	67
Ferruginous Quartz, etc.,	67	Smoky Quartz,	65
Flint,	12	Special Collections,	68
Fusibility, Collections of Scale of,	5	Species, Check List of,	23 to 32
Gadolinite,	63	" Table of New Mineral,	48, 49, 50, 51
Garnet, White,	6	" Book List on Original Descriptions of,	83
Gems,	84	" Table of Properties of,	33 to 47
" and Ornamental Stones, Book List on,	75, 76, 77	Specific Gravity, Minerals arranged according to,	56
Gold and Silver, Book List on,	68	Steel, Book List on,	71, 72, 73, 74
" and Silver, Minerals, Collections of,	66	Stephanite,	4
Greasy Quartz,	5	Sulphohalite,	51
Guanajuatite,	3, 4	Sunstone,	67
Hanksite,	54	Tin, Book List on,	70
Hardness, Table of, and Collections of,	65	Titanite or Sphene illustrated,	63
Heliotrope,	67	Titanium Minerals, illustrated,	60
Hornstone,	60	Tourmaline, Brown,	5
Hydrotitanite,	57	Valencianite,	5
Indianite,	71, 72, 73, 74	Vanadinite, Brown, Barrel-shaped,	4
Iron, Book List on,	68	" Red,	4
" Minerals, Collections of,	67	Variscite, illustrated,	64
Itcolumite,	67	Venus's Hair stone,	60, 66
Jasper,	67	Verd, Antique,	59
Labradorite,	57	Wulfenite, Red,	4
Lead, Book List on,	70	" Yellow,	5
" Minerals, Collections of,	68	Zinc Minerals, Collections of,	68
Local Mineralogy, Book List on,	87, 88, 89	Zircon, Twinned, illustrated,	64
Light and Heat, Collections of Minerals used for,	68	Zonochlorite, illustrated,	62

OF GENERAL INTEREST.



White-Capped Amazon Stone, with Albite,
Pike's Peak, Col.

A.E. FOOTE.

When the first edition of my Catalogue was printed (1876), it was with the greatest reluctance that I issued it, as I knew that the tremendous pressure of Centennial work had prevented me from giving it the proper revision and supervision even in proof reading.

Feeling as I did its many defects, the high commendation that it received and the 6,000 copies that have sold for cash, have been a source of great gratification to me. I have constantly improved it and decreased the price, until this edition will be sent free to every customer requesting it, and the heavy paper and bound copies will be sent at as near the actual cost of paper and binding as we can make them. I can still say that in preparing this Catalogue it has been my aim to make it of such value that no chemist or mineralogist, whether amateur, student or Professor of Mineralogy or Chemistry, would feel as if he could afford to be without it, and in doing this, I have spared no expense, either in the way of illustration or labor.

The articles on Microcline or Amazon Stone, Hydro-titanite, Protovermiculite, Variscite, Astrophyllite, Mica, Feldspar, Quartz, Diamond, Jet, Leidyite, Ceruleolactite, Paramorphs of Rutile after Brookite, Randite, etc., etc., are worth three times the price. My previous Catalogue received the highest commendation from scientific men everywhere (see the note from Prof. Winchell on title page). In this I have corrected some mistakes found in the other, and more than quadrupled the amount of purely scientific matter. Attention is called to the fact that, owing to the fine print used, it contains more than double the matter of most books of the same size. A new book containing so much purely scientific matter has very rarely if ever before been published for \$1.00. Over 30 of the pages cost me from \$15.00 to \$25.00 each before a single copy was printed. Every engraving and wood-cut used was made expressly for me, except the few used to illustrate Feldspar, and part of those illustrating crystallography, which are from Dana's Manual of Min. and Lith., price \$1.75.

The stock now consists of over 100 tons and over 700,000 specimens, mainly crystallized, and such massive things as Agate, Chlorastrolite, Schorlomite, etc., that are only found massive. Having now letters on file from over 21,500 different correspondents all over the world, most of whom are customers, my facilities for getting anything desired on short notice are unsurpassed, and I doubt if they are equalled.

Collecting every mineral at the localities where it is found in the best specimens and the greatest abundance

and in ton quantities where possible, most species can be furnished at lower rates than they have hitherto been sold for.

I made eight trips and spent over a year's time and \$5,000 cash at the Amazon Stone locality alone; have made five trips to Mexico, and spent over six months collecting there; nearly a year in Arkansas and Missouri, and many months in Arizona, California, New Mexico, Canada, New Jersey, New York, Illinois, Georgia, Pennsylvania, North Carolina, etc., etc. In Europe I have spent much time in Hungary, Cornwall, and other mining regions. I shall always make a specialty of collecting new and rare specimens.

An examination of the character of my elementary collections and the minerals sold in quantities, will show that they are far lower than hitherto advertised by other dealers. The accurate labelling of every specimen is guaranteed.

As the correct naming of the specimens will be the most important part to many who will see this Catalogue, I feel myself justified in mentioning that I have been a collector of minerals for twenty-seven years; that I was a student under Prof. Wolcott Gibbs at Cambridge and Prof. A. Hoffman, at Berlin. I was also Instructor in Michigan University and Professor in Iowa State Agricultural College, in Chemistry and Mineralogy, for six years.

Every specimen in my establishment is plainly labelled with the price, species number, and in most cases the composition also. Nine-tenths of the specimens are labelled with printed labels that cannot be removed except by long soaking.

I aim to put all the specimens at the lowest possible price. There is no variation from the marked prices. This has been our invariable rule on books from the start, and we shall make it invariable in our mineral department hereafter. The printed price is affixed so that customers may know that, unlike most other dealers in this line, I do not vary my prices from time to time as occasion demands or the individual asks. It also guarantees to every individual who exchanges with me that they will get exactly the same prices as if they gave cash. It is a gratification to me that this plan has lately been adopted by many dealers. I will allow any person buying any article to return it within one week and take anything else they wish to the same amount or refund their money, less ten per cent. to pay for the trouble of handling (if they are not satisfied). Of course, if mistakes are made or the articles are not exactly as represented,

A. E. FOOTE'S CATALOGUE OF MINERALS.

the money will be refunded without reduction, on the return of the articles, or others sent in place, as may be preferred by the customer. Giving up a lucrative profession to go into this business because I liked it, I have not been disappointed, and now expect to continue in it throughout life, and hope that my children may continue it after me. I do not believe that I can afford to have any customer dissatisfied, and prefer to lose rather than to have any person feel that I have not treated them justly. It will always be taken as an especial favor if any cause of dissatisfaction is immediately reported to me. My success has been due to the kind recommendations of the leading scientific men everywhere.

Prof. E. S. Dana, in a letter says: "I wish you even success, and consider that you have done a great deal toward the extension of a knowledge of mineralogy in this country."

From the late President of American Association for the Advancement of Science:

Louisville, Ky., Aug.

PROF. FOOTE—Dear Sir: It is with great pleasure that I consent to your using my name for reference, as being of great use, both to the scientific and amateur naturalist.

Yours truly,

J. LAWRENCE SMITH.

I have received similar letters from Dr. Joseph Leidy, Prof. S. F. Baird, and many others.

University of the State of Missouri, Columbia, Mo.

PROF. A. E. FOOTE—My Dear Sir: I feel that all scientists owe you a debt of gratitude for your labors in bringing together so vast a collection of minerals, and selling them so cheap that every student of science may have a collection. Yours, etc.,

G. C. SWALLOW, Dean of Tech. Faculty.

The systematic collections, of which over 9,000 have been sent all over the world, are sold at less than one quarter what any such collections were sold at before we commenced business, and are still more than twice as good as any one else furnishes at the same price.

Drury College, Springfield, Mo.

I wish to thank you for the valuable collection of minerals which you sent me. You are doing a good work for students by bringing these cheap sets within their reach. Very respectfully yours,

E. M. SHEPARD (Prof.).

Windham, Ohio.

PROF. FOOTE—Dear Sir: I received the amateur collection, 100 minerals, that you sent me yesterday, and it was an agreeable surprise. The beauty and size of the specimens astonished me. I never expected to be in possession of any such collection, and I fear you are not well paid. If not I will send you more money, for I would not take twice what it cost me. I express my great obligations to you with thanks, until better paid. Yours, very respectfully,

A. JAGGER.

See references in advertisement.

No such list of Mineralogical books as those in this Catalogue has ever been offered for sale before to my knowledge, and a few out of a large number of pleasant letters are appended:

University of Ohio, Columbus, O.

PROF. FOOTE—The books came to hand all correct, and you have my thanks for promptness. The books are a bargain. Yours very truly,

PROF. S. W. ROBINSON,

Sandwich, Ill.

PROF. A. E. FOOTE—Invoice of books came to hand all right. Original cost when published \$9.00 per vol. Now the set of 3 vols. costs only \$5.00. Books are in excellent condition, paper superior, illustrations capital, print very fine indeed. A good bargain; an inexpensive method of obtaining valuable editions of a classical character, and, the best of all, so cheap.

Respectfully yours, NAHUM A. BALLOU, M.D.

*University of the City of New York, Medical Dep't.,
No. 410 East 26th Street, New York.*

MY DEAR SIR:—We get the BULLETIN, and it is a matter of surprise that so much can be gotten into so small compass. The books ordered by Prof. Arnold came O.K., and the price was remarkably low. We can get no such quotations from second-hand dealers here.

Very Respectfully,

M. N. MILLER, M.D.

Demonstrator of Practical Physiology.

A. E. FOOTE, M.D., 1223 Belmont Ave., Phila., Pa.

Our price list of Minerals and Mineralogical books is sent free to all.

A large number of postal card inquiries for Catalogue receive no notice, as I suppose them to come from school children who wish to gratify a little idle curiosity. It is sent on receipt of price which is below cost, or free to Museums and heads of Natural History or Chemical departments in colleges applying for it on their official paper, or intending purchasers writing on headed paper. The price paid will be credited on the first purchase if requested. Sample copy of the LEISURE HOUR sent free to any one. To insure a prompt reply postage should always be enclosed. It is a small matter to you, but our postage bills amount to between \$200 and \$300 each month.

The kindness of scientific men everywhere has been acknowledged, but credit must be given to Profs. Dana, Eggleston, and Brush for the free use that has been made of their works on Mineralogy in preparing the lists, tables, and various articles in the Catalogue, and to Prof. J. W. Judd for an urgent invitation to display our collections in the South Kensington Museums.

Competent assistants supplied to private collectors who wish to visit interesting localities. In most cases payment for services can be made in specimens. Collections named and arranged at very low rates.

Shipping Directions.

There are two principal lines of Express to Philadelphia, the United States and Adams. Parties living at towns where there is no line but the Adams, will, of course, have to send by it, but parties living at places where there is any other line are requested to ship by the other line. No packages sent by Adams, unless requested in the order for goods.

The following rules, which are those of the largest dealers in Mathematical, Optical, and Philosophical instruments in the United States, are those which we shall hereafter adopt:

"The prices throughout the Catalogue will be strictly adhered to.

"When no satisfactory Philadelphia or New York reference is given by the party ordering the goods, or if the order is less than \$5, the money should accompany the order; but where it does not (either for want of confidence or other cause) the goods will be forwarded by express, with bill, C. O. D. (collect on delivery), provided a remittance equal to one-fifth of the total amount of the order be sent with it.

"The Express Company's charge for collecting and returning the money on C. O. D. bills must be paid by the party ordering the goods.

"The safest and most economical method of remitting money is by Bank Draft or check on Philadelphia, Boston, New York, or Post Office Order, made payable to me. Where neither of these can be procured, United States or National Bank Notes or Postage Stamps can be sent by express, or by registered letter, with safety, the sender prepaying the express charges.

Country checks not wanted, as our bank charges us for collection. If you have a bank account your bank ought to issue you a New York draft without charge.

"Goods ordered to be sent by mail must be prepaid, and the return postage included in the remittance.

"All the packing-boxes will be charged for, and all goods will be packed with the utmost care; but no responsibility will be assumed by us for breakage, loss in carriage, or other damage, after a package leaves our premises, except upon special contract."

Packing-boxes, with screw covers, not charged for if returned in good condition prepaid.

There is nothing that I strive to exercise more care about than packing and shipping. I put able men at it, and unless accident and delay is very plainly my fault, I do not consider myself responsible.

In all cases customers must pay freight and postage.

The special attention of all visiting 1223 Belmont Ave. is called to the fact that my place of business is but eight minutes railroad ride from the Broad Street Station, Public Buildings and business centre of the city. That it is reached by Pennsylvania Railroad trains every half hour. The Chestnut and Walnut, Arch, Race and Vine street cars run by the door, and Market, Girard, and South Street cars are near by.

All American books in print supplied on order. Foreign books obtained to order in a few weeks. Of the second-hand books on my list I have generally only single copies, but when sold I replace them as soon as possible.

So far as I know, my arrangements for keeping watch of the needs of my correspondents are the most perfect that have thus far been devised.

THE NATURALISTS' LEISURE HOUR AND Monthly Bulletin

A. E. FOOTE.

1223 BELMONT AVE., N. 44TH ST.; Philadelphia, Pa.

Opposite Girard Avenue Station, Pennsylvania R. R.

Take Chestnut & Walnut Str. Cars, or Penn. R. R., Main Line West.

13TH YEAR.
Monthly—75 cts. a Year.

SCIENCE AND PRACTICE.

No. 114, March, 1889.

A FIRE OPAL.

Iris dwells in thee and throws
Rays of leaf-green and of rose,
Limpid amber courseth through
Violet glooms of fading hue.

Opal, well surnamed of fire,
If some stranger should inquire
Whence thy swift caprices came
Morn-mist, closing evening-flame—
Do thou kindling answer bring,
Many-passioned lambent thing!
Say with cosmic throe was born
All thy life of love and scorn,
Yet not chance but deathless law
Bred thy beauty from a flaw.
Speak thou, too, with perfect art,
For wild Genius' burning heart,
Whose perfection springs, like thine,
From some touch of scath divine.

Edith M. Thomas in the Century.

The Amethyst—Freedom from Care.

The February-born will find
Sincerity and peace of mind,
Freedom from passion, and from care,
If they the Amethyst will wear.

MINERALS—NEW ARRIVALS.

Since the issue of my last Price List and Catalogue of Minerals, my stock has increased so remarkably that it is impossible to specify any except a very few of the most recent and important additions.

Much of my time in the last three years has been spent in collecting: three trips having been made to Mexico, and many to Arizona, New Mexico, California, and other western localities. Several weeks have been spent at interesting localities in Cornwall and the North of England, and much time at various localities in Europe. Besides, I have spent several hundred dollars in advertising in *Nature* and other English papers for specimens and collections. What results these efforts yielded is shown by the fact that in the three years since the last edition of my Catalogue was issued, I have received over 900 boxes of well crystallized specimens weighing over 50 tons.

The revisions in our new Catalogue we have been intending to make for years, but have not before from a lack of time. The mistakes have, so far as possible, been corrected, and the new species list will be almost indispensable to every working mineralogist until there is a new edition of Dana's System. This and the revision of the price list has alone cost me over \$180 in my assistant's time, and many times as much in my own. Our price list, filling ten pages closely printed, is the most complete ever issued. No such list of books, pamphlets and excerpts for sale on the subjects of Mining and Mineralogy has ever been seen as those we now offer on over 30 pages.

This list alone is worth a year's subscription to the *LEISURE HOUR*. Many papers are catalogued that will not pay us for the handling, simply to make our lists as complete as possible.

A number of new species have been collected by us at various localities. The latest of these are Sulphohalite and Mazapilite, descriptions of which are published together with the new species list in our April bulletin. Price of March and April, on heavy paper, 5 cents each, light paper free.

CALIFORNIA MINERALS.

Many of the trips, like the one into the borax regions, near Death Valley, involved considerable danger and hardship. The shipping point for the borax regions is in the desert, and work is entirely stopped during the summer at Death Valley.

A weeks visit at Borax Lake (the best locality) secured the finest crystals of *Hanksite* ever seen. I shall give a full account of this interesting locality, with records of drill holes 300 feet in depth. A month before my visit an 8-inch well had been drilled to a depth of over 100 feet for the purpose of exploring the immense alkaline deposit. At the depth of 35 feet a small cavity was struck, from which were pumped through the drill hole the finest crystals ever seen. In these the pyramidal planes were much more developed than in the crystals originally described. There were only a few of these that were perfect, the most of them being broken by the drill. All of these, except a very few given to one person before I arrived, I secured.

Besides the value these "drill-hole" crystals have from their size and perfection, it is exceedingly probable that this form will be quite rare, as it was the first time it had been found since the deposit was first worked, over fifteen years ago, although other wells had been sunk previously. Crystals and groups of this form \$1.00 to \$15.00 each. From the same cavity was pumped the new species *Sulphohalite*.

The form indicated in figure 1 of the original description (see page 64 of the Fifth Annual Report of the California State Mining Bureau) was found about six years ago, and has not been met with since. We have a few good crystals 50c. to \$2.50 each. These have readily sold heretofore for \$5.00 to \$7.00 each.

The groups similar to *Aragonite*, see figure 2 same page, are more common. In them the pyramidal planes are almost obliterated. Groups 25c. to \$5.00. Extra large museum groups \$5.00 to \$10.00.

As all these specimens were secured by me at the locality, they were oiled by me on the spot, and do not present the rounded or worn appearance usually shown.

The finely crystallized *Trona* is very desirable 50c. to \$5.00. As *Borax* mining has not paid, *Colemanite*, *Thenardite*, and other alkaline minerals, will probably be more scarce in the future than in the past. The *Colemanite* dumps were thoroughly worked, and yielded us some good specimens, but the best we got came from a collection made several years ago. Cleavages, price 5c. to 25c.; crystals 10c. to .50.; fine groups of crystals 50c. to \$10.00. *Thenardite* in fine crossed crystals, 5c. to \$1.00. We have also *Borax*, *Halite*, *Glauberite*, and other alkaline minerals from San Bernardino Co., at from 25c. to \$1.50.

ARIZONA MINERALS.

Descloisite from *Pima Co.*—From a collector we obtained the finest crystallized specimen of this rare mineral that has ever been seen. It weighs 9½ lbs., measures 9½ inches in length and seven in diameter, \$100.00; smaller well-crystallized specimens, some associated with *Vanadinite* crystals, \$2.00 to \$10.00; fragments well crystallized, 10c. to \$1.50. All the above are from a silver mine no longer worked.

Vanadinite doubly terminated crystals, with straw-colored centres and red terminations on good pieces of gangue, *Pima Co.*, \$1.00 to \$5.00; fragments well crystallized, 10c. to 75c.

I obtained the finest lot of red *Vanadinite* that has ever been seen from Yuma, and at prices so reasonable that I can sell them at less than one-half what they have ever been sold at before. Beautiful specimens from 50c. to \$15.00. Small pieces very choice for the microscope, 10c. to \$1.00.

We have also some red skeleton crystals similar to the *Pyromorphite* from *Ems* that are the largest *Vanadinite* crystals ever seen—25c. to \$2.50, each. Also, straw-colored crystals from the same mine.

Brown Barrel-shaped Vanadinite crystals were obtained by me at the mine at such low prices that we are able to sell them at from 25c. to

\$5.00 per specimen. Small fragments showing perfect crystals, 5c. to 25c.

Wulfenite Red.—Another hard trip to the Red Cloud mine enabled me to secure some specimens that the superintendent had been saving for me for over a year. As the district is now almost entirely abandoned, and no more good specimens are now found at the mine, I was very glad to secure these, as I had sold all that I had taken to Europe. Large specimen groups, \$1.00 to \$25.00; fragments and crystals, 5c. to \$1.50.

Dumortierite.—I secured the finest specimens ever seen of this beautiful new species when I was in Yuma Co., and can offer them at exceedingly low prices considering the quality. Good specimens of bright blue color 10c. to \$5.00.

From the Copper Queen mine and from *Morenci* I have obtained the finest *Azurites* and *Malachite pseudomorph after Azurite* ever seen. Some of the *Azurite pseudomorphs* have the surface a brilliant blue, and the entire centre of malachite, the acicular *Malachite* in some cases growing out of the brilliant blue faces. Specimens, 10c. to \$7.50.

Malachite fibrous in beautiful surfaces and tufts, 5c. to \$5.00; same penetrating clear calcite, 25c. to \$10.00; *Malachite* polished, 50c. to \$3.00; *Malachite* and *Azurite* banded in a charming manner, 75c. to \$5.00.

Chrysocolla, with very glossy, lustrous fracture, the finest ever seen, 10c. to \$5.00.

Cuprite, very brilliant, and finer than the Cornish, 50c. to \$5.00. Small fragments for the microscope, &c., 5c. to 35c.

Azurite in perfect balls of crystals, 5c. to \$1.00.

Azurite in groups and crystals, 5c. to \$10.00.

Brochantite, good crystals, 25c. to \$5.00.

Covellite, good specimens, 15c. to \$1.50.

THE MEXICAN MINERALS

are the result of the purchase of six entire collections of mining engineers and experienced collectors, and the choice of all the specimens in the collection of the Professor of Mineralogy in the Mining College of Guanajuato. These purchases, made on my last trip, aggregated several thousands of dollars.

Besides the *Mazapilite* (described later), I can mention the finest *wire silver* that I have ever seen for sale, 6½ inches long, from an *Argentite* base, \$75.00. Another 2½ inches long, has crystals of calcite beautifully strung along it, \$7.50. Smaller wires on and off the gangue from 5c. to \$5.00.

Polybasite crystals and groups on the gangue, 50c. to \$10.00.

Argentite fine crystals, separate and on the gangue, 10c. to \$10.00.

Stephanite, \$1.00 to \$5.00.

Pyrrargyrite fine crystals and groups, \$1.00 to \$15.00; small crystals, 10c. to 75c.

Opals.—The wonderful popularity of this beautiful stone is fully justified by its extraordinary loveliness. I brought back from Mexico this time the finest lot of these I have ever seen for sale. We have them of all kinds, *precious*, or *noble*, *fire*, *harlequin*, *milky*, *opal agate*, *opal with inclusions*, *hyalite*, etc., cut and in the rough, from 5c. to \$50.00.

Our *Out Opals* vary from $\frac{1}{8}$ inch to $\frac{3}{4}$ inch in diameter, and from 25c. to \$6.00 in price. Besides these we have the following very extraordinary specimens, suitable for setting.

A magnificent specimen fire opal, $1\frac{1}{2}$ inches in diameter, price, \$35.00.

Very perfect fire opals, exceedingly rich, \$1.00 to \$12.50; smaller, 25c. to 75c.

Harlequin Opal, brilliantly spangled with red, blue, and green, $\frac{3}{4}$ in. by $\frac{1}{2}$ in., perfect, \$50.00.

Precious *Milky Opal*, brilliantly clouded with red, green and blue $\frac{3}{4}$ of an inch by $\frac{3}{8}$ inch, \$30.00.

Milky opals that gleam and shine

Like sullen fires in a pallid mist.

RUSKIN.

Opal Agate from the State of Jalisco is especially noteworthy, from the charming manner in which the soft shades of pink, green, and yellow are blended, 10c. to \$1.50. On our visit to Guadalajara, with the excursion given by the State of Jalisco, we obtained a number of good things.

Pearlite var Sphaerulite and *Pitchstone*, from \$10c. to \$10.00.

Obsidian, mottled with red (*Marekanite*), from 5c. to \$1.00.

The *Twin Calcites* that we obtained at Guanaquato are more interesting in form than any we ever had before. Some (like Fig. 566, Dana's System) are doubly-terminated, rose-colored, and associated with a different form, from \$1.00 to \$10.00; others are almost heart-shaped (like 572 Dana's System), 25c. to \$5.00; others, smaller, from 10c. to \$1.00; some chocolate colored, 25c. to \$1.50.

Rose calcite twin, the finest ever seen, diameter $6\frac{1}{2}$ inches, \$50.00.

Quartz pseudomorph after calcite, 25c. to \$1.00.

Quartz, containing moving bubbles, 50c. to \$2.50.

Amethyst, some very fine, 10c. to \$5.00.

Apophyllite, $12\frac{1}{2} \times 10$ inches, very fine surface, entirely covered with large crystals, \$50.00.

A smaller, very gemmy specimen, \$50.00.

Others very nice, smaller, 50c. to \$10.00.

Rose colored *Apophyllite*, \$3.50 to \$20.00.

Valencianite, from the old Valenciana mine, in fine museum specimens, one 11 inches by 6 inches, \$20.00.

Others a little smaller, \$2.50 to \$10.00.

Others smaller, 15c. to \$2.00.

Guanaquatile, \$1.00 to \$10.00.

Cuprodesclousite, from Mexico, 25c. to \$2.00.

Cassiterite, both tinstone and large masses, 25c. to \$10.00.

Mexican Onyx, beautifully banded, 25c. to \$2.50.

We again visited the celebrated *Turquoise* locality in *New Mexico*, and have some of the finest deep blue pieces we have ever seen, 10c. to \$5.00.

In *New Mexico* we were very fortunate in striking a pocket of brilliant *yellow Wulfenite* equal to the best ever found at Eureka, Nevada.

It is associated with *flos ferri*. The thin and delicate plates are very beautiful. Specimens, \$2.00 to \$10.00; fragments, brilliant, 10c. to \$1.50.

Gadolinite, from *Texas*, in crystals and masses, 25c. to \$10.00, each.

Also, a new material from the same locality, that is now being investigated.

Minerals from other American localities have been received in large quantities, among the most interesting are the crystals of *Magnetite* from the Moriah Mine, Essex Co., N. Y.

These so-called interrupted crystals have been worked out of the solid ore with great labor, and are only occasionally met with. They occur in almost all possible modifications of the octohedron, even to an apparent rhomb, 5c. to \$1.00. Very powerful masses of *loadstones*, lifting railroad spikes, \$10.00 to \$15.00; smaller, 10c. to \$5.00.

A very full assortment of *Phenacite*, *Bertrandite*, *Gütermannite*, *Zunyite*, *Megabazite*, *Conichalcite*, *Clinoclase*, *Tyrolite*, and the other Utah copper minerals.

A few small fragments of the Nelson Co., Ky., *Meteorite*, up to five and one-quarter ounces in weight, that were broken off in Kentucky before the main mass (now in the Vienna Museum) was sold, from 25c. to \$50.00.

From Franklin I have recently obtained the largest brown *Tourmaline* group ever seen, price, \$25.00. Also, a large number of very nice green *Tourmalines*, 10c. to \$1.50. Very fine *Franklinite*, *Troostite*, *Automolite*, *Dysluite*, *Jeffersonite*, *Anomolite*, *Chalcophanite*, *Bementite*, *Zincite*, *Tephroite*, *Chalcozincite*, and other minerals peculiar to this interesting locality.

Very fine lots of twin feldspars, *staurolites*, *Zircons*, and *rutile* just received.

EUROPEAN MINERALS.

These minerals were not purchased in the usual way of simply visiting the dealers in the large cities, but over \$100 was spent in advertising for collections. Much time was devoted to visiting the various localities,—two weeks in Cornwall, several weeks in Austria and Hungary, much time in Cumberland and the north of England, where we paid one collector over \$1,000, who had either mined the specimens himself or had bought them from the miners. We are, therefore, able to price them at far lower rates than could be offered by those who merely make the circuit of the great cities, buying their material in London, Paris, Vienna, and Berlin, after they have already paid several profits.

I venture to say that the *green Fluors*, some with *bubbles*, other colored *Fluors*, *Barites*, *Rhodocrosites*, *Witherites*, *Alstonite*, *Baryto-calcite*, *Tellurium*, and many other minerals are offered at the lowest prices ever known in America. The doubly terminated *Witherites* are especially remarkable, \$1.50 to \$10.00. *Siderite*, the finest crystals ever seen, from the Tincroft and other Cornish mines, 5 cents to \$5. The other Cornish minerals were obtained almost entirely from old collections, either purchased outright, or as duplicates, from two of the best Cornish collections known. The owners of these collections would have paid me cash, but I much preferred to take exchange in order

to have the material for my American customers. Among them were Liroconites, Bismuth native, Bismuthinite, Bornite, Redruthite, Chalcopyrite, Blister Ore, Childrenite, Pharmacosiderite, Chalcosiderite, Cronstedtite, Clinoclase, Libethenite, Olivenite, Torbernite, Autunite, Connellite, Ludlamite, Stannite, Liskeardite, Enysite, Langite, Cassiterite pseudomorph after feldspar, Condurrite, Tetrahedrite, Bournonite, Fluorite, Cuprite, Gothite, Axinite, Pyromorphite, Chalcophyllite, Scorodite.

From other European localities we have Gold, Arsenic, Allemontite, Bismuth, Sulphur, Orpiment, Sphalerite, in yellow crystals, and the resinous brilliant cleavages of Spain, Celestite, Linnaeite, Cobaltite, Niccolite, Pyrite, Arsenopyrite, Magnetic Sand, Psilomelane—very fine—Elastic Bitumen, Hatchettite, Ozocerite, Galena pseudomorph after Pyromorphite, Bismutite, Aerinite, Ardenite, Napoleonite, Fibroferrite, Leadhillite, Alexandrite, Sylvanite, Nagyagite, Matlockite, and Phosgenite, Amethyst, showing internal markings (Phantom Crystals).

Crocidolite, in the natural, unaltered blue fibres and Quartz pseudomorph after Crocidolite from a land owner in South Africa, at the lowest price that has ever been known. We can furnish the material in the rough at from 10 cents to 25 cents per pound. Besides the ordinary seams sawed up into slabs, we have fibres of golden yellow color interlaced with the unaltered blue fibres. This is usually considered far more beautiful than the ordinary variety, on account of its greater play of light and shade.

Rhodonite, polished, from Franklin, N. J., and from Russia, in slabs of the finest color ever seen, Epidote, Gadolinite, Axinite, Labradorite, Baverno twins, Cinnamon Stone, Diopside, Andalusite, Euclase, Adularia, Green Spinel, Diopside, Adamite, Cupreous Calamine, Prehnite, Tetradymite, Sodalite, Ludwigite, Krennerite, Chalcodony Geodes containing fluid, \$3.00. Nagyagite, many pseudomorphs, Batrachite, Brandisite, Scheelite, Zinnwaldite, Leonhardite, Bournonite, Tetrahedrite, Manganocalcite, Diaphorite, Enargite, Greenockite crystals, Manganite, Herrensgründite, Crocoite, Sammet Blende, Cronstedtite (Kuttenberg), Aragonite (Cumberland, Aragon, Bilin, Bex, etc.), Harmotome, Pucherite, Anglesite, Pyromorphite, Vesuvianite, Mimetite, Erythrite, Wolframite, Linarite, Lapis Lazuli, from Chili and Persia, Cerussite, Pandermite. See price list for prices.

GEMS.—Besides the very beautiful Malachite associated with Azurite, from Arizona, 25 cents to \$5, we have a fine lot of the precious Opal Agate, 25 cents to \$5; Turquoise, very deep color, 25c. to \$5.00; some fine Star Sapphires and Corundum Cat's Eyes, 50 cents to \$10, and Blue Sapphires from Ceylon, 25 cents to \$5; fine Moonstones from Ceylon, 10 cents to \$1; Crocidolite balls, cubes, etc., for pins, charms, sleeve buttons, etc., 5 cents to \$2; Labradorite horse shoes, balls, sleeve links, etc., 75 cents to \$1.50; Topaz, 75 cents to \$5; Emeralds, \$2.50, upwards; Aquamarines, 10 cents to \$5; Gem Opals, 25 cents to \$5.

Especial attention is called to the lists of

Pseudomorphs and Minerals for the microscope that are published at the end of the price list. The latter especially includes only a few out of a large number of species fitted for microscopic examination.

WANTED.—Epidote, even massive, Arsenopyrite, Topaz, red and brown Ochres, Pyrolusite Anhydrite. Dolomite, Millerite, etc.

BOOK LIST—WHERE FOUND.

Mineralogy, Mining, Metallurgy & Price List of Minerals, March & April, 1889.
Brain and Nerve, Urinary, Venereal, Skin, Eye, and Ear diseases, January, 1889.
Anatomy and Physiology, Surgery, Medical Microscopy, Medical and Physiological Chemistry, Domestic Medicine, Hydropathy, Dec., 1888.
Obstetrics, Practice, Cholera, Fevers, Medical Books wanted, November, 1888.
Hygiene, Water, Food, Yellow Fever, Oct., 1888.
Ethnology and allied subjects, Slavery, Geology, and Official Geological Surveys Addenda, General Science, Domestic Economy, May, 1888.
Entomology, Mammalogy, Ornithology, and Miscellaneous Zoology, March, 1888.
Microscopy, Foreign Travels, Chemistry and Chemical Technology, September, 1887.
Conchology, Invertebrata, Zoology, July 1887.
Mammalogy, Ornithology, Ichthyology, Herpetology, June, 1887.
Botany, May, 1887.
Geology Addenda, Light, Heat, Physics, Electricity, Astronomy, April, 1887.
Medicine, supplementary, March, 1887.
Americana, North & Central, Nov. & Dec., 1886.
Geology and Palaeontology, September, 1886.
Official Geological Surveys, August, 1886.
Education, Scientific Hist. and Biography, Sci. Dictionaries and Encyclopaedias, May, 1886.
Technology, Am. Institute Trans., April, 1886.
Beneficial and Noxious Insects, Horticulture, Agriculture, Agl. Reports, Public Parks, Mar., 1886.
Journals, Publications of Scientific Societies, Popular Science Monthly, January, 1886.

MINERALOGICAL BOOKS WANTED.

The following books are no longer in stock; a good price either in cash or exchange will be paid for them:

Accum. Analysis of Minerals. 1st Am. ed., 1809; *Adam.* Tableau Mineralogique; *Am. Jour. of Mining*, ed. by Dawson, complete set; *Am. Mineralogical Jour.* ed. by Bruce, all pub.; *Anderson.* Theory of the Formation of Veins; *Ashley.* Copper Mines of Lake Superior; *Babington.* Mineralogy; *Bailey.* Mines of N. Y.; *Batch.* Mines, Miners and Mining Index of U. S.; *Barba.* Metals, Mines and Minerals; *Bergman.* Mineralogy, 1783; *Bickerstaff.* Cat. of Collect. of Minerals; *Bingley.* Minerals, 1818; *Blake.* Rare Cal. Minerals; *Blondel.* Les Bijoux des Peuples Primitifs; *Bolton.* Application of Organic Acids to the Exam. of Minerals; *Bombicci.* Museo Mineralogico; *Bowie.* Hydraulic Mining; *Browne.* Solid Meteors and Aerolites; *Buechner.* Meteoriten; *Castellani.* Antique Jewelry; *Cat. of Min.*

MINERALOGICAL BOOKS WANTED, RARE BOOKS FOR SALE.

Collection of Literary and Hist. Soc., Quebec; Chilian Exhibit at the Centennial; Chism. Patio Process in San Delnas, Mex.; Collins. Mineralogy, 2 vol; Combes. L'Exploitation des Mines; Cotta. Ore Deposits; Cronstedt. Syst. of Mineralogy. 1st ed., 1772; Crookes & Roehrig. Metallurgy; Dakota Mining Reports; D'Aumalie. Report on Mines of Cieneguita Co., Mex.; Davis. Slate; Delafosse. Mineralogie; De Rome de l'Isle. Cristallographie; Des Cloiseaux. Manuel; Dewey. Testing and and Working Silver Ore; Domeyko. Mineralogia de Chile; Drinker. Treatise on Mining; Drinker. Tunnelling; Dufrenoy. Mineralogy; Dudley. Chem. Properties of Steel Rails; Dyer. Black Diamonds; Egleston. Diagrams to illustrate Lectures on Crystallography; Fairchild. Mineralogy; Feuchtwanger. Gems, col. pl.; Foster. Classification of Fossils and Minerals, London, 1740; Gobet. Ancient Mineralogists; Grundriss der Mineralogie; Gregg & Lettsom, Min. of Great Britain & Ireland; Haidinger. Treatise on Mineralogy; Hall. Cat. of Minerals of Vt., etc, 1824; Hamlin. Tourmaline; Hanks. Cuproscheelite; Hanks. Gold Nuggets; Harrington. Analysis of Rocks and Minerals; Harris. Value of Lehigh Coal & Nav. Co.; Hazlitt. Gold Fields of Cariboo; Hunt. Hydro-metallurgy of Copper; Jackson. Minerals and their Uses; Jeans. Steel, Hist. and Manufacture; John. Nat. Hist. of Amber; Jour. of the Iron and Steel Inst., Vols. and Nos.; Kennigott. Lehrbuch der Mineralogie; Kerr. Gold Gravels of N. C.; Kerr. Mica Veins of N. C.; King. Stones from the Heavens; Kobell. Discrimination of Minerals by Simple Chem. Experiments; Kuestel. Nevada & Cal. Process for Silver & Gold Extraction; Lawrence. Lithology, Engl., French and German; Lawrence. Min. Localities etc. of Western States; Lawton. Mines & Minerals of Mich.; Leeds. Microsc. Examination of Silicates; Leonhard. Mineralogie u. Geologie, 3 vol.; Linne. Gen. Syst. of Min. Kingdom; Lovell. Pammineralogicon Oxford 1661; Macheure. Cat. of Min. & Geol. Specimens at Harmony, Ind.; Mariposa Gold Co. Cal. Reports; Mawe. Mineralogy of Derbyshire; Mohs. Mineralogy; Mont Pyrenees Mineralogy; Montana Mining Reports; Murray. The Diamond; Pollen. Gold and Silver; Ponson. Mines de Houille; Pujouls. Popular Mineralogy; Pumpelly. Paragenesis of Rocks of Lake Superior; Rath. Paramorphosen von Rutil nach Arkansit; Roy. Coal Mines; Rose. Mineral Syst.; Salero Mining & Man. Co., Arizona. Reports by Pumpelly et al.; Schweisser. Syst. of Min.; Silversmith. Handbook for Metallurgists; Smith. Laboratory of Metals and Minerals; Spargo. Mines of Cornwall & Devon; Staebner. Forms of Silica; Thorpe. Coal and its Uses; Traill. Quartz and Opal; Triunfo Silver Mining Co. Cal.; Villefosse. Richesse Minérale; Wadsworth. Min. of Boston & Vicinity; Whittlesey. Menominee Iron Region; Whittlesey et al. Reports on Phoenix Copper Co., Mich.; Withering. Mineralogy; Woodward. Papers for further Advancement of Knowledge of Minerals, etc., 1728; Woodward. Nat. Hist. of the Earth, especially Minerals, 1702; Wright. Production of Lake Superior Iron Mines.

SCIENTIFIC AND VALUABLE BOOKS.

Lindley & Hutton. Fossil Flora of Great Britain, 3 vols., rare, original edition, with 250 plates, \$15.00; Latham, J., General Synopsis of Birds, 10 vols., orig. ed., pub. at \$50.00, our price \$25.00; Jasper. Birds of N. Am., very fine copy, bound in hf. mor., pub. at \$40.00, our price, \$25.00; Richthofen's China. Ergebnisse eigener Reisen und darauf gegruendeter Studien, 3 vols., 4to, many plates and folio Atlas, new, \$25.00; Michaux, North American Sylva, 2 vols., 802 pp., 156 plates, hmo, 1819, very rare, \$25.00; Martyn, New Dictionary of Nat. Hist., \$3.50; Albin, Nat. Hist. of English Insects, col'd plates, calf, 4to., 1720, rare, \$5.00; Hofmeister, Germination, etc., of Higher Cryptogamia and Fructification of Coniferae, 65 plates, \$7.50; Greville, Algae Britannica, 19 col'd plates, half mor., \$6.00; Agassiz, Mollusques Fossiles, 105 plates, \$8.00, published at \$24.00; Mammal, Geological Facts, etc., 102 colored plates, 4to, \$3.50; Kuetzing, Species Algarum, half calf, \$2.50; Ruysch, Theatrum Universale Ommium Animalium, 1718, folio, calf, \$7.50; Hind, Report on Assiniboine and Saskatchewan Expedition, 1859, 4to, \$10.00; Thompson, Bibliography of State of Ohio, 1880, \$2.50; Morison, Plantarum Historiae Universalis Oxoniensis, 1738, folio, calf, \$5.00; Sennert, Opera, 1650, folio, calf, \$5.00; Holmes et al. The Harvard Book, 57 portraits, 4to, half mor., \$10.00; Bramhall, Military Souvenir, 91 steel plates, morocco, \$3.00; Gray, Botany of Wilkes Expedition, Atlas alone, folio, hf. mor., \$12.50; Thornton, Botanical Extracts on Philosophy of Botany, 3 vols., folio, morocco, full gilt, \$15.00; Cheselden, Osteographia, or Anatomy of the Bones, 1733, \$7.50; Herschell, Results of Astronomical Observations, 1834 to 1838, 4to, \$7.50; Tryon, Manual of Conchology, vols. 1 to 7, 5 vols., hmo, 2 p., cost nearly \$100.00, our price, \$40.00; Hoffs, American Pomologist, 36 col'd plates, 4to, \$2.50; Flint, Physiology of Man, 5 vols., \$7.50; Holmes, Surgery, 3 vols., calf, 1881, \$14.00; Medical and Surgical History of the War, 6 vols., \$30.00; Jeancon, Atlas of Human Anatomy, folio, \$12.50; Evelyn, Sylva, orig. ed., 1664, calf, \$5.00; Dixon, Geology of Sussex, 1850, \$5.00; Jones, Nests and Eggs of Birds of Ohio, 68 plates, 15 by 17 inches, colored by hand, with text (only 90 copies produced), \$350.00; Tenth Census of U. S., complete set \$22.50; Humboldt, Nouvelle-Espagne, 3 vols., 4to, \$12.00; Biographical Dictionary of Penna. of the 19th Century, 209 steel portraits, full mor., gilt, 4to, \$5.00.

Special attention is called to the following sets of Journals at very low prices:

Nature, 36 vols., 1869 to 1887, \$60; *Am. Jour. Sci. and Arts*, 127 vols., \$200; *Am. Jour. Medical Sciences*, 120 vols., bound, \$100; *Popular Sci. Monthly*, 28 vols., \$35; *Am. Jour. of Obstetrics*, 1868 to 1887, \$55; *Am. Naturalist*, 20 vols., \$55; *Proceedings Am. Pharmaceutical Ass'n*, 1851 to 1884, \$50; *Pacific R. R. Reports*, 13 vols., \$15; *U. S. Agl. Reports*, 38 vols., \$10; *2d Geol. Surv. of Penna.*, 81 vols., \$40; *Smithsonian Reports*, 31 vols., \$15; *Am. Journal of Pharmacy*, 1825 to 1885, \$60; *Annals of the Lyceum of Natural History*, vols. 1 to 10, half morocco, \$25.

CRYSTALLIZATION.

Slightly altered and abridged from Dana's Manual of Mineralogy and Lithology. See 18636. \$1.75

The attraction which produces crystals is one of the fundamental properties of matter. It is identical with the cohesion of ordinary solidification; for there are few cases outside of the kingdoms of life in which solidification takes place without some degree of crystallization. Cohesive attraction is, in fact, the organizing or structure-making principle in organic nature; it produces specific forms for each species of matter, as life does for each living species. A bar of cast-iron is rough and hackly in surface, because of the angular crystalline grains which the iron assumed as solidification took place.

A fragment of marble glistens in the sun, owing to the reflection of light from innumerable crystalline surfaces, every grain in the mass having its crystalline structure. When the cold of winter settles over the earth in the higher temperate and colder latitudes it



25—SNOW CRYSTALS.—System VI Hexagonal.

the signal for crystallization over all out-door nature; the air is filled with crystal flakes when it snows; the streams become coated with an aggregation of crystals called ice; and windows are covered with frost, because crystal has been added to crystal in long feathered lines over the glass—Jack Frost's work being the making of crystals. Water can not solidify without crystallization, and neither can iron nor lead, nor any mineral material, with perhaps a half dozen exceptions. Crystallization produces masses made of crystalline grains when it cannot make distinct crystals. Granite mountains are mountains of crystals, each particle being crystalline in nature and structure. The lava current, as it cools, becomes a mass of crystalline grains. In fact the earth may be said to have crystal foundations; and if there is not the beauty of external form, there is everywhere the interior profounder beauty of universal law—the same law of symmetry which, when external circumstances permit, lead to the perfect crystal with regular facets and angles.

Crystals are alone in making known the fact that this law of symmetry is one of the laws of cohesive attraction, and that under it this attraction not only brings the particles of matter into forms of mathematical symmetry, but often develops scores of brilliant facets over their surface with mathematical exactness in position.

Crystals teach also the more wonderful fact that the same species of matter may receive, under the action of this attraction, through some yet incomprehensible changes in its condition, a great diversity of forms from the solid of half a dozen planes to one of scores.

At the time of crystallization the material is usually in a state of fusion, or of gas or vapor, or of solution. In the case of iron the crystallization takes place from a state of fusion, and while the result is ordinarily a mass of crystalline grains, distinct crystals are sometimes formed in any cavities. If, in the cooling of a crucible of melted lead, bismuth, or sulphur, the crust be broken soon after it forms, and the liquid part within be turned out, crystals will be found covering the interior. Here also is crystallization from a state of fusion. When frost or snow flakes form, it exemplifies crystallization from a state of vapor. If a saturated solution of alum, made with hot water, be left to cool, crystals of alum after awhile will appear, and will become of large size if there is enough of the solution. A solution of common salt, or of sugar, affords crystals in the same way. Again, whenever a mineral is produced through the change or decomposition of another, and at the same time assumes the solid state, it takes at once a crystalline structure, if it does not also develop crystals.

Further, the crystalline texture of a solid mass may often be changed without fusion; e.g., in tempering steel the bar is changed from coarse-grained steel to fine-grained by heating and then cooling it suddenly in cold water, and vice versa, and this is a change in every grain throughout the bar.

Thus the various processes of solidification are processes of crystallization, and the most universal of all facts about minerals is that they are crystalline in texture. A few exceptions have been alluded to, and one example of these is the mineral opal, in which even the microscope detects no evidence of a crystalline condition, except sometimes in minute portions supposed not to be opal. But if we exclude coals and resins this mineral stands almost alone. Such facts, therefore, do not affect the conclusion that a knowledge of crystallography is of the highest importance to the mineralogist. It is important because,

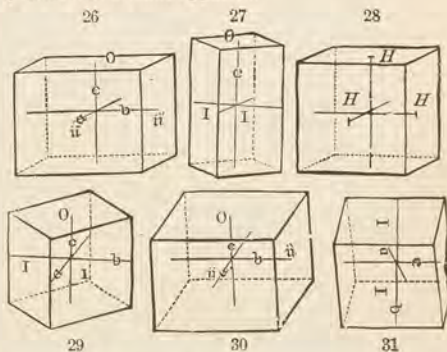
1. A study of the crystalline forms and structures of minerals is a convenient means of distinguishing species—the crystals of a species being essentially constant in structure and in angles.

2. The most important optical characters depend on the crystallization, and have to be learned from crystals.

3. The profoundest chemical relations of minerals are often exhibited in the relations of their crystalline forms.

4. Crystallization opens to us nature at her foundation work, and illustrates its mathematical character.

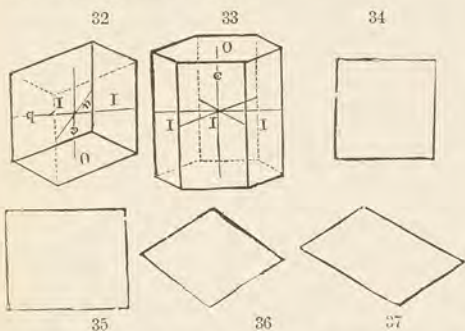
The forms of crystals are exceedingly various, while the systems of crystallization, based on their mathematical distinctions, are only six in number. Some of the simplest of the forms under these six systems are views represented in the following eight figures, and by a study of these forms the distinctions of the six systems will become apparent.



These prisms are all four-sided except the last which is six sided. In them the planes of the top and bottom and any planes that might be made parallel to

these, are called the basal planes, and the sides the lateral planes. An imaginary line joining the centres of the bases (c in figures 26 to 33) is called the vertical axis, and the diagonals *a* and *b*, drawn in a plane parallel to the base, are the lateral axes.

Fig. 26 represents a cube. It has all its planes square (like figure 34), and all its planes and solid angles, right angles, and the three axes consequently cross at right angles (or, in other words, make a rectangular intersection,) and are equal.



It is an example under the first of the systems of crystallization, which system, in allusion to the equality of the axes, is called the **Isometric** system, from the Greek, for equal and measure, see figs. 26, 34, 38, 39, 40, 41, 42, 43.

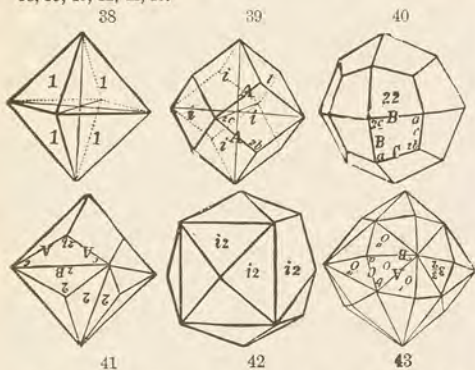


Fig. 27 represents an erect or right square prism, having all its plane angles and solid angles rectangular. The base is square or a tetragon, and consequently the lateral axes are equal and rectangular in their intersections; but, unlike a cube, the vertical axis is unequal to the lateral. There are, hence, in the square prism, axes of two kinds making rectangular intersections. The system is hence called, in allusion to the two kinds of axes, the dimetric system, or, in allusion to the tetragonal base, the **Tetragonal** system. Figs. 27, 19, 20.



Figure 28 represents an erect or right rectangular prism, in which, also, the plane angles and solid angles are rectangular. The base is a rectangle (Fig. 35) and consequently the lateral axes connecting the centres of the opposite lateral faces are unequal and rec-

tangular in their intersections; and at the same time each is unequal to the vertical. There are hence three unlike axes making rectangular intersections; and in allusion to the three unlike axes, the system is called the trimetric system. It is also named, in allusion to its including erect prisms having a rhombic base the **Orthorhombic** system, orthos, in Greek, signifying straight or erect. See cosphorite, reddingite, &c. This rhombic prism is represented in fig. 29. It has a rhombic base, like Fig. 36; the lateral axes connected the centres of the opposite lateral edges, and hence they cross at right angles and are equal, as in the rectangular prism. This right rhombic prism is therefore one in system with the right rectangular prism.

Fig. 30 represents another rectangular prism, and Fig. 31 another rhombic prism; but unlike figures 28 and 29 the prisms are inclined backward, and are therefore oblique prisms. The lateral axes (*a* *b*) are at right angles to one another and unequal, as in the preceding system, but the vertical axis is inclined to the plane of the lateral axes. It is inclined, however, to only one of the lateral axes, it being at right angles to the other, hence, of the three angles of axial intersection, two are rectangular, namely, *a* on *b*, and *c* on *b*, while one is oblique, that is *c* (the vertical axis) on *a*. In allusion to this fact, there being only one oblique angle, this system is called the **Monoclinic** system, from the Greek for one and inclined. See Figs. 30, 31 & 1 to 8 Brookite, pages 53 & 54, and 1 to 8 under Orthoclase, page 46.

Fig. 32 represents an oblique prism with a rhomboidal base, like Fig. 37. The three axes are equal, and the three axial intersections are all oblique. The system is called the **Triclinic** system from the Greek for three and inclined. See Figs. 1 to 8 under Albits, page 46 and Fairfieldite, etc.

Figure 33 represents a six-sided prism, with the sides equal, and the base a regular hexagon. The lateral axes are here three in number. They intersect at angles of 60°; and this is so whether these lateral axes be lines joining the centers of opposite lateral planes or of opposite lateral edges, as a trial will show. The vertical axis is at right angles to the plane of the three lateral axes, in as much as the prism is erect or right. The base of the prism being a regular hexagon, the system is called the **Hexagonal** system. See Figs. 10, 11 & 12, page 47.

CRYSTALLOGRAPHIC SERIES.

Isometric.

- 1 Fluorite, Cubical.
- 2 Perovskite, Cubo-octohedral.
- 3 Garnet, Dodecahedral.
- 4 Leucite, Trapezohedral.

Tetragonal.

- 5 Zircon.
- 6 Idocrase.
- 7 Wulfenite
- Orthorhombic.
- 8 Brookite
- 9 Staurolite, Twin.

Monoclinic.

- 10 Pyroxene.
- 11 Gypsum, v. Selenite.
- 12 Spheue.
- 13 Orthoclase.

Triclinic.

- 14 Microcline.

Hexagonal.

- 15 Quartz.

16 Tourmaline.

17 Apatite.

Double Refraction.

- 18 Iceland Spar, shows by its rhombohedral *cleavage* that it belongs to the Hexagonal system

Fibrous.

- 19 Asbestos.

Stellated.

- 20 Wave.lite.

Lamellar.

- 21 Muscovite.

Botryoidal.

- 22 Göthite.

Twin Crystal.

- 23 Rutile (Giculated)
- 24 Calcite.

Pseudomorph.

- 25 Limonite after Pyrite.

25 specimens in a box, \$1.00; larger, \$2.50 to \$5.00. 50 specimens in box, \$5.00, or larger, \$10.00 to \$25.00.

A. E. FOOTE'S Collection of Minerals.

- 2 Sulphur, S. California.
3 Molybdenite, MoS₂, Renfrew Co., Canada.
4 Stibnite, Gray Antimony, Sb₂S₃, Sevier Co., Arkansas.
5 Graphite, Plumbago, C, Colfax County, New Mexico.
6 Gold, Au, California.
7 Silver, (Argent), Ag, Zacatecas, Mexico.
8 Cerargyrite and Embozite, Silver City, New Mexico.
9 Cinnabar, Mercury Sulphide, HgS₂, California.
10 Copper, Cu, (Lake Superior Region), Michigan.
11 Chalcocryte, Copper Pyrites, Milan, N. Hampshire.
12 Tetrahedrite, Gray Copper, 4 CuS + Sb₂S₃, Peru.
13 Cuprite, Red Copper, Copper Queen Mine, Arizona.
14 Malachite, Green Copper Carbonate, Copper Queen Ariz.
15 Azurite, Blue Copper Carbonate, Morenci, Arizona.
16 Galenite, Lead Ore, PbS, Jasper County, Missouri.
17 Wulfenite, Lead Molybdate, Yuma Co., Arizona.
18 Pyromorphite, Lead Phosphate, Phoenixville, Penna.
19 Cerussite, White Lead Ore, PbCO₃, Yuma Co., Ariz.
20 Sphalerite, Zinc Blende, ZnS, Jasper County, Mo.
21 Zincite, Red Zinc Ore, Zinc Oxide, ZnO, Franklin, N.J.
22 Willemite, Troostite, 2 ZnO + SiO₂, Franklin, N.J.
23 Calamine, Hydrus Zinc Silicate, Friedensville, Pa.
24 Cassiterite, Stream Tin, SnO₂, Jalisco, Mexico.
25 Rutile, Nierite, TiO₂, Magnet Cove, Arkansas.
26 Pyrite, Irons Gold, FeS₂, Milan, New Hampshire.
27 Pyrrhotite, Magnetic Pyrites, Gap Mine, Penna.
28 Arsenopyrite, Mispickel, FeAsS, Brintree, Vermont.
29 Hematite, Specular Iron Ore, Marquette Co., Mich.
30 Magnetite, Lodestone, FeFe₂O₄, Magnet Cove, Ark.
31 Franklinite, (FeZnMn) (Fe₂Mn₂) O₄, Franklin, N.J.
32 Chromite, Chromic Iron, (FeCr) O₃, Texas, Penna.
33 Limonite, Brown Hematite, Negaunee, Michigan.
34 Columbite, Niobite, FeO₂Nb₂, Chesterfield, Mass.
35 Vivianite, 3 FeO₂P₂O₈ + 8 aq, Mullica Hill, New Jersey.
36 Siderite, Spathe Iron, FeCO₃, Roxbury, Conn.
37 Psilomelane, Hard Manganese, MnO₂ + H₂O etc., Ga.
38 Corundum, Al₂O₃, Laurens C. H., South Carolina.
39 Spinel, MgOAl₂O₃, Sussex County, New Jersey.
40 Cryolite, Ice Stone, 3 NaF + Al₂F₆, Ivigluk, Greenland.
41 Alunite, Alum Stone, Muzai, Hungary.
42 Turquois, Al₂O₃P₂O₅ + 5 H₂O, Los Cerillos, N. Mex.
43 Wavellite, 3 Al₂O₃2 P₂O₅ + 12 aq, Montgomery Co., Ark.
44 Magnesite, MgCO₃, Texas, Lancaster Co., Penna.
45 Fluorite, Fluor spar, CaF₂, Roselisle, Illinois.
46 Gypsum, Plaster, CaOSO₂ + 2 aq, Grand Rapids, Mich.
47 Anhydrite, Cubic spar, CaOSO₂, New Brunswick.
48 Apatite, Renfrew Co., Ontario, Canada.
49 Calcite, Lime spar, CaOCO₃, Guanajuato, Mexico.
50 Marble, CaOCO₃, Vermont.
51 Aragonite, Flus Ferri, CaOCO₃, Organ Mts., N. Mex.
52 Dolomite, (CaCaMg) OCO₃, Jasper Co., Missouri.
53 Barite, Heavy spar, BaOSO₂, Cheshire, Connecticut.
54 Celestine, SrOSO₂, Strontian Island, Lake Erie.
55 Halite, Common Salt, NaCl, Bermuda.
56 Nitratine, Soda Nitre, Na₂O N₂O₅, Peru.
57 Quartz, Rock Crystal, SiO₂, Hot Springs, Arkansas.
58 " Milky, Philadelphia, Pennsylvania.
59 " Smoky, Cairngorm Stone, Pike's Peak, Col.
60 " Chalcedony, Yellowstone National Park.
61 " Agate, Agate Harbor, Lake Superior.
62 " Chert, Jasper County, Missouri.
63 " Jasper, near Ottawa, Canada.
64 Opal, SiO₂ + aq Queretaro, Mexico.
65 Pyroxene, Augite, Natural Bridge, Diana, Lewis Co., N.Y.
66 Rhodonite, Fowlerite, MnOSO₂, Franklin, N.J.
67 Spodumene, Chesterfield, Massachusetts.
68 Amphibole, Hornblende, Renfrew Co., Ontario, Can.
69 Amphibole, Actinolite, Delaware County, Penna.
70 Beryl, Be₂Al₂O₆Si₂, Aikworth, New Hampshire.
71 Chrysolite, Olivine 2 (MgFe) O₂ Si₂, Jackson Co., N.C.
72 Garnet, Sticken River, Alaska.
73 Zircon, 2 Zr OSiO₂, Renfrew Co., Ontario, Canada.
74 Vesuvianite, Idocrase, Woodstock, Maine.
75 Epidote, CaFeAl₂Si₂O₇ Silicate, Putnam County, N. Y.
76 Zoisite, Lime Epidote, Conway, Mass.
77 Muscovite, Common Mica, Jackson County, N. C.
78 Biotite, Black Mica, Essex County, New York.
79 Wernerite, Scapolite, Bolton, Massachusetts.
80 Labradorite, Mt. Marcy, Essex County, New York.
81 Albite, Soda Feldspar, Chesterfield, Mass.
82 Microcline, Amazon Stone, Pike's Peak, Colorado.
83 Orthoclase, Common Feldspar, Black Hawk, Colorado.
84 Tourmaline, Schorl, Pierrepont, New York.
85 Andalusite, Chistolite, Al₂O₃SiO₂, Lancaster, Mass.
86 Cyanite, False Sapphire, Al₂O₃SiO₂, Norwich, Conn.
87 Topaz, Al₂SiO₅, Trumbull, Connecticut.
88 Datolite, H₂Ca₂B₂O₇Si₂, Bergen Hill, New Jersey.
89 Titanite, Sphene, Renfrew Co., Ontario, Canada.
90 Staurolite, Fannin County, Georgia.
91 Apophyllite, Pyramidal Zeolite, Bergen Hill, N. J.
92 Natrolite, Needle Zeolite, Bergen Hill, New Jersey.
93 Stibazite, Cube Zeolite, Nova Scotia.
94 Stibite, Radiated Zeolite, Frankford, Pennsylvania.
95 Talc, Steatite Soapstone Quarries, Montgomery Co., Pa.
96 Glauconite, Green Sand, Mullica Hill, New Jersey.
97 Serpentine, " " " " Texas, Lancaster Co., Pa.
98 Kaolinite, Dixon's Quarry, Delaware.
99 Epidote, Chlorite, Clinchore, Chester Co., Pa.
100 Asphaltum, (Hydrocarbon), Cuba, W. I.
101 Anthracite (mainly Carbon), Lehigh County, Pa.
102 Orpiment, Auripigment, Felsobanya, Hungary.
103 Tetradymite, Bi₂(TeS₃)₄, Zsuzbok, Hungary.
104 Argentite, Ag₂S, Silver Glance, Real del Monte, Mex.
105 Pyrrargyrite, Ruby Silver, Guanajuato, Mexico.
106 Platinum, Pt, Pl. O. ford, California.
107 Chalcocite, Copr. Glance, Cu₂S, Cheshire, Conn.
108 Bornite, Erubescite, Cu₅FeS₄, Calico District, N. M.
109 Chrysocolla, Cu₂O, Si₂O₃ + 2 aq, Morenci, Arizona.
110 Vanadinite, PbVO₄ + 1/2 H₂O, Yuma Co., Ariz.
111 Sphalerite, Black Jack ZnS, Cumberland, Eng.
112 Sphalerite, Raby Blende ZnS, Jasper County, Mo.
113 Smithsonite, Dry Blende ZnCO₃, Friedensville, Pa.
114 Stannite, PbPyrites, Cornwall, Eng.
115 Brookite, Arkanstite, TiO₂, Magnet Cove, Ark.
116 Perovskite, CaO TiO₂, Magnet Cove, Ark.
117 Genthoite, Sn₂ NiO MgO, Webster, Jackson Co., N. C.
118 Forbernite, Uranite, Cornwall, England.
119 Pyrite, (Chalcocite), FeS₂, Schuch, Kill Valley, Pa.
120 Pyrite, (Pyritoid Form), FeS₂, Black Hawk, Colo.
121 Marcasite, White Iron Pyrites, FeS₂, Jasper Co., Mo.
122 Hematite, (Crystals), Fe₂O₃, Aikworth, New York.
123 Hematite, Red Ochre, Fe₂O₃, Clinton, New York.
124 Martite, Fe₂O₃, In Prochlorite, Chelsea, Rhode Island.
125 Menaccanite, Ilmenite, (TiFe) O₂, Rhode Island.
126 Magnetite, Fe₂O₃ FeO (Crystals), Hartford Co., Md.
127 Limonite, Pseudomorph after pyrite, Apishpa, Colo.
128 Limonite, Brown Ochre, Fe₂O₃ + 3 H₂O, Chester Co., Pa.
129 Goethite, Wood Ore, Fe₂O₃ + H₂O, Superior Mine, Mich.
130 Copiapite, Iron Alum, Atacam, Chile.
131 Wolframite, (FeMn) OWO₃, Cornwall, Eng.
132 Pyrolusite, MnO₂, Nova Scotia.
133 Wad, Copper Queen Mine, Cochise County, Arizona.
134 Triplite, Peru, Maine.
135 Rhodochrosite, MnOCO₃, Kapnik, Hungary.
136 Corundum, Emery, Asia Minor.
137 Gahnite, Variety Dysulite, Sterling Hill, N. J.
138 Amblygonite, Hebron, Maine.
139 Lazulite, Blue spar, Graves Mt., Georgia.
140 Variscite, Al₂O₃Fe₂O₃ + aq, Montgomery Co., Ark.
141 Marskite (new Elements), Mitchell County, N. C.
142 Allanite, Orthite, Amherst County, Virginia.
143 Fluorite, Green Fluor Spar, CaF₂, Durham, Eng.
144 Gypsum, Selonite, CaOSO₂ + 2 aq, Indian Territory.
145 Gypsum (fibrous), Owosso, Cayuga Co., New York.
146 Ulexite, Hants County, Nova Scotia.
147 Colemanite, San Bernardino Co., California.
148 Calcite, Nailhead Spar, CaOCO₃, Cumberland, Eng.
149 " Cleavage rhombohedron, St. Lawrence Co., N.Y.
150 " Stalagmite, Mammoth Cave, Kentucky.
151 " Chalk, Dover Cliffs, England.
152 " Calcareous Tufa, Petrified Moss, Oswego Co., N.Y.
153 " Limestone, Oolite, Humbolt, Iowa.
154 Dolomite, Marble, Westchester Co., N. Y.
155 Barite (Stinkstone), BaOSO₂ + CH₃, Berks Co., Pa.
156 Witherite, BaCO₃, Alston Moor, England.
157 Barytocalcite, BaCO₃ CaOCO₃, Alston Moor, Eng.
158 Strontianite, SrCO₃, Hannu, Westphalia.
159 Thénardite, Borax Lake, San Bernardino Co., Cal.
160 Quartz, Amethyst, SiO₂, Guanajuato, Mexico.
161 " Rose-colored, Black Hills, Dakota.
162 " Moss Agate, Deadwood, Dakota.
163 " Pseudo, after Crocidolite, Tiger Eye, S. Africa.
164 " Homestone (Hornstone), Hot Springs, Ark.
165 " Flint, Dover Cliffs, England.
166 " Petrified Wood, Bijou Basin, Colo.
167 Fire Opal, SiO₂ + aq, Queretaro, Mexico.
168 Opal, Infusorial Earth, or Tripoli, Richmond, Va.
169 Tridymite, SiO₂, San Christobal, Hidalgo, Mexico.
170 Enstatite, Bronzite, Webster, North Carolina.
171 Woll

A. E. FOOTE'S Collection of Minerals.

- 183 Orthoclase (Cleavage), Delaware Co., Pennsylvania.
- 184 Tourmaline, Brown, Hamburg, New Jersey.
- 185 Fibrolite, Brandywine Springs, New Castle Co., Del.
- 186 Staurolite, (twin,) Fannin Co., Georgia.
- 187 Pectolite, Bergen Hill, New Jersey.
- 188 Talc, Foliated, Harford Co., Maryland.
- 189 " Rensselaerite, St. Lawrence Co., New York.
- 190 Pyrophyllite, Graves Mt., Georgia.
- 191 Serpentine, Williamsite, Texas, Lancaster Co., Pa.
- 192 Deweyite, Jackson County, North Carolina.
- 193 Vermiculite, Lenni, Delaware Co., Pennsylvania.
- 194 Protovermiculite, Magnet Cove, Arkansas.
- 195 Chloritoid, Masonite, Natick, Rhode Island.
- 196 Ozocerite, Native Paraffin, Boryslaw, Galicia.
- 197 Elaterite, Elastic Bitumen, Derbyshire, England.
- 198 Copalite, Retinite, C 85.5 H 11.5 O 3%, Zanzibar, Africa.
- 199 Bituminous Coal, Evansville, Indiana.
- 200 Cannel Coal C. West Virginia.

The preceding collection includes in the first 100 every species in the list advised in Dana's Manual, and some species like Wulfenite, Vivianite, Nitratine, Labradorite, Datolite, Titanite, and Cerargyrite that are especially advised by Brush, Nason, Egleston, and other writers on Mineralogy and Blowpipe Analysis; also, other species like Turquoise, Azurite, Microcline, and Wavellite that are important and beautiful. It illustrates the principal species and grand subdivisions of minerals, the more important ores, and by the selection of a few from the second hundred, contains minerals in which all the elements have been found. It is the cheapest and best collection ever put up, being an improvement on the one of which we have put up so many thousands in the last few years. It is well fitted for illustrating Chemical Lectures, Physical Geography, etc. The second 100 includes all the remaining varieties mentioned in Dana's list, and minerals illustrating the rarer elements. The third hundred includes still more rare and mostly less important species and varieties as per the following list. Customers can make their own selections from the 300, or from our price list, but the prices will be somewhat higher than if our regular collections are taken. This is due to the fact that the work of putting the collections up, labelling, and packing, is thoroughly systematized.

For blowpipe purposes we substitute 10 species, for the varieties of Silica, etc. in the first 100, at an expense of 15% additional, and about 50 species for varieties in the second 100 at an expense of 50% additional, as many of these are much more rare.

Aegirite, Albertite, Almontite, Analcite, Antimony, Asenite, Astrophyllite, Atacamite, Automolite, Autunite, Balmite, Basanite, Bismuthinite, Borax, Bournonite, Braunitz, Bromite, Brucite, Carnellite, Cassiterite, Chalcanthite, Chalcopyrite, Chalcocite, Chlorastrolite, Chondrodite, Chrysotile, Citrine, Copiapite, Danburite, Desclozite, Diabantite, Dufrenoyite, Dumortierite, Erythrite, Essonite, Flexible Sandstone, Gadolinite, Greenockite, Hagmannite, Hanksite, Haydenite, Henggrundite, Hel. trope, Heulandite, Hyacinth, Hydrodolomite, Hydrous Anthrophyllite, Hypersthene, Indicolite, Janssonite, Jeffersonite, Langite, Lebetenite, Loxocase, Ludwigite, Mangauite, Millerite, Mimeteite, Oligoclase, Olivenite, Paracolumbite, Petroleum, Pharmacosiderite, Phenacite, Proustite, Rubellite, Sassolite, Schorlomite, Sualite, Sylvanite, Thompsonite, Tyrolite, Uintahite Uranotil, Zaratite, and 25 others are included in our third hundred.

3.—Antimony Glance, Antimonite, Stibine, Spiessglas, Stannil.

4.—Black lead, carburet of iron, mica pictoria nigra, mica des peintress, crayon, reissbley, fer carbure.

7.—Kerargyrite, Horn Silver, Buttermilcherz, Argyroceratite, Chlorobromide of Silver.

12.—Octahedral Copper Ore, Oxysulphate of Copper, Ruterite.

13.—False emerald, molochites, berggrun, mountain green, Atlaserz.

14.—Chessey copper or lazurite, azure copper ore.

15.—Galena, targonite, Steinmannite, Johnstonite, plumbine, Fournette.

16.—Plomb molybdate, yellow lead spar.

17.—Green lead ore, brown lead ore, polysphaerite, Miesite, Nussierite, Cherokine.

18.—Carbonate of lead, Iglesiasite.

19-110-111.—Cleophane, narmatite, Christophite, Przibramite, marasmolite, Rahtite.

21.—Red Oxid of Zinc, Sterlingite, ruby zinc, Spartalite.

22.—Siliceous Oxid of Zinc, Williamsite.

23.—Wagite, electric calamine, hemimorphite.

24.—Wood tin, toads-eye tin, tin stone, tin ore.

25.—Sagenite, Crispite, Ilmeno-rutile, titanite, red schorl.

- 25-118-119.—Iron Pyrites, mundic eisenkies.
- 28-121-122.—Micaceous, reddish, red chalk, clay iron-stone, argillaceous hematite, jasper clay-iron stone, lenticular iron ore, itabirite, iron glance.
- 29-125.—Magnesian, titaniferous, ochreous, magnetic.
- 31.—Chromoferrite, siderochrome.
- 32-126-127.—Bog-ore, brown clay iron-stone, pisolite, colitic, yellow ochre.
- 33.—Cranotantalite, uranoniobite, yttrilmenite.
- 34.—Eisenblau, blue iron earth, Fer azure, Eisenglimmer, Eisen-Phyllit, Glaukosiderit, Auglarite, Mullcite.
- 35.—Oligonite, siderodot, sphaerosiderite, sparry iron, brown spar, steel ore.
- 36.—Black Hematite, Compact black manganese ore.
- 37-135.—Sapphire, hyacinth, carbuncle, ruby or oriental ruby, oriental topaz, oriental emerald, oriental amethyst, asteriated sapphire, adamantinite stone, Armenian stone.
- 38.—Spinel ruby, Balas ruby, Rubicella, Almandine ruby, Chloro-spinel, Hcolite.
- 43.—Lamellar, Baudissierite, Breunerite, Walmstedtite.
- 44-142.—Katoftite, chlorophane, antozonite, blue John, Derbyshire spar.
- 45-143-144.—Satinspar, alabaster, Montmartite.
- 46.—Anhydrous, Calcium Sulphate, Tripe Stone, Vulpinite.
- 47.—Asparagus stone, moroxite, lazurapatite, Francolite, phosphorite, eupyrethrite, osteolite, fluor-apatite, chlorapatite, pseudoapatite.
- 48-147 to 152.—Calc spar, Iceland spar, doubly refracting spar, rhomb spar, preunierite, natrocalcite, Reichite, dolomitic, ferrocalcite, manganoalcite, plumbocalcite, neotype, Spartite, calcimangite, strontianocalcite, Fontainebleau limestone, Hissopite, satin-spar, argentine, apatite, granular limestone, saccharoidal limestone, marbles (statuary, Parian, Carrara, sienna, cipolin, verde antique, architectural, shell, madreporic, encrial, lunachelle, ruin, landscape, lithographic, breccia), hydraulic limestone, calcareous marl, pisolite, stalactite, alabaster, Gibraltar stone, calc sinter, travertine, inollite, agaric, stink-stone, lucellite, hematocoonite, siderocoonite, anthracoonite, swine stone, rock milk, rock meal, calcareous spar.
- 50.—Corallolite, Stalactite, Satin Spar, Arragon Spar, Iglite, Nadelstein, Chimbrazite, Tarnovizit, Mossotite.
- 51-153.—Miemite, Gurhofite, architectural, saccharoid, porcellaneous, feriferous, brown spar, Brossite, Tharandite, manganiferous, cobaltiferous, conite, bitter spar, rhomb spar, pearl spar.
- 52-154.—Bolognastone, allomorphite, calcareoburite, cawk, baretine.
- 53.—Calciocelesteite, barytocelesteite.
- 55 to 62-159 to 165.—Star, asteriated, false topaz, citrine, greasy, siderite, sapphire, sagenite, catseye, aventurine, chloritic, actinolite, micaceous, arenaceous, agatized wood, green, Berlin, flint, Carnelian, bloodstone, heliotrope, chrysoprase prase, plasma, nicolait, oryx, sardonius, mochasstone, hornstone, basanite, Lydian stone or touchstone, Egyptian Jasper, porcelain Jasper, quartzite, conglomerate, sandstone, tabular, Haytorite, Beckite, Babel, silicified shells.
- 63-166-167.—Precious, girasol, common, resin, wax, semi-hydrophane, Forcherite, euecholong, agate, moailite, hyalite, Muller's glass, fiorite, silicious sinter, Michaelite, geyserite, tripolite, Randonite, tripoli slate, alum-ocalcite, jasp-opal, wood-opal, glass-opal, pearl sinter.
- 64-171.—Malaccolite, Alalite, Mussite, Travassellite, Sahlite, Baikalite, prothelite, Funkite, diallage, hypersthene, bronzite, Hedenbergite, Lotallite, Scheffelite, Richterite, Jeffersonite, leucoguite, Fassalite, argente, Hudsonite, polykite, Breislakite, Lavroffite, hydrous, picropheyl, Pyralolite, Schiller spar, Pitkanandite, Strakonizite, Monrodite, hydrous diallage.
- 65.—Bustamite, Marcelline, heteroclin, dyssnite, Allagite Photite, horn-manganese.
- 67-68-172-173.—Grammatite, Nordenschioldite, raphilite, nephrite, jade, kidney stone, calanite, sebestite, antholite, Richterite, Cummingtonite, Dannemorite, asberferrite, Grunerite, mountain leather, mountain paper, mountain cork, mountain wood, amianthus, byssolite, Edenite, Smaragdite, green diallage, Pyargite, diastatite, Syntagmetite, Wallerian, Norallite, Gausigradite, hydrous anthophyllite.
- 69.—Emerald, aquamarine, hyacinthozones, amethyste basaltine, chrysoberyllus, chryoprasus, chrysolithus, Davidsonite, Goshenite.
- 70.—Precious, Common, Glinkite Hyalosiderite, Peridot.
- 71-176.—Grossularite, cinnamon-stone, essonite, hyacinth, succinite, romanzovite, pyrope, Bohemian garnet, carbuncle, almandite, precious or oriental garnet, Spessartite, Andradite, allochroite, topazolite, colonophone, Pyreneite, Jelletite, Calderite, polyadelphite, Rothomite, aplome, ytter-garnet, Bredbergite, Ouarovite.

A. E. Foote's Collection of Minerals.

72.—Hyacinth, Engelhardtite, calyptolite, jargon, jacinth, topazius.

73.—Heteromerite, Xanthite, Cyprine.

74.—Scorza, Arenalite, thallite, Delphinite, Oisanite, Puschkinite, Achmatite, Escherite, Bucklandite, Bagrationite, Withamite, pistacite.

75.—Unionite, Thulite, Saussurite.

76.—(Mica)—potash, biaxial, oblique, Glimmer, phenigite, nacrite, Fuchsite, Adamsite.

78.—Nuttallite, Chelmsfordite, glaucolite, rapidolith, paranthine, Fuchsite, atheriastite, stroganovite, Algerite, Wilsonite, terenite, pinitartiger, talkartiger, gabbronite.

79.—Saussurite, Radaute, silicite, mornite, Labradorstein, lime feldspar, Labrador Feldspar, chatoyant, opaline.

80.—Aventurine feldspar, moonstone, peristerite, pericline, hyposclerite, Cleavelandite, olafite, felsite, petrosilex, Adinole, oligoklis-albit, hellefinta, feldspath, tetartin, periklin.

82-183.—Feldspar, adularia, moonstone, potash feldspar, Valencianite, sunstone or aventurine feldspar, heliolite, neeromite, Amazon stone, eyrhrith, sanidin, ice-spar, rhyacolite, Chesterlite, loxoclaste, paradoxite, Cottaitte, muldan, lazurfeldspar, Perthite, Murchisonite, Weissigite, Leunilite, Delawarite, Cassinite, Leelite, pegmatolite, felsite, feldstein, orthose, orthoklas, glasier feldspath, hellefinta, petrosilex, lapis corneus.

89-184.—Rubellite, indicolite, Brazilian sapphire, Brazilian emerald, chrysolite of Brazil, peridot of Ceylon, achroite, apurizite.

85.—Talc bleu, sappare, kyanite, disthene, rhoetizite.

86.—Physalite, Pycnite.

87.—Botryolite, Esmarkite, Humbolite.

88.—Semeline, Lederite, Aspidelite, Ligurite, Greenovite, Spinthere.

90.—Mesotype, epointee, Oxhaverite, xylochlore, teselitte, Ichthyophthalmite, Albin, leucocyclite.

91.—Galactite, Fargite, Bergmannite, Spreusteine, Brevicite, radiolite, palaeo-natrolite, crocalite, Savaite, iron-natrolite.

92.—Acadialite, Phacolite, Haydenite.

93.—Sphaerostilbite, Syhedrite.

94-188-189.—Soapstone, potstone, lapis ollaris, French chalk, indurated, agalmatolite, pyroallolite, Pitkarandite.

96-191.—Noble, Common, resinous, retinalite, vorhau-serite, porcellaneous, porcellophite, meerscham, Bowenite, Antigorite, marmolite, kerolite, thermophyllite, chrysolite, pierolite, metaxite, Baltimore, verde-antique.

97.—Argilliform, Fariniform, Lithomarge, Ferruginous, Porcelain Clay, Fuller's Earth.

98.—Kotschubeite, Exfoliating, Klinechlor.

99.—Asphalt, Mineral Pitch, Pittasphalt or Mineral Tar.

100-199-200.—Native coke, lignite, torbanite, mineral charcoal, jet.

102.—Ore of Tellurium, Telluric Bismuth, Tellurbis-muth.

103.—Silver Glance, Sulphuret of Silver, Vitreous Silver.

104.—Red Silver ore, Antimonial Red Silver, Rubin-blende.

105.—Redruthite, Vitreous Copper, Sulphuret of Copper.

107.—Purple Copper ore, Variegated Copper ore, Horse-flesh ore.

108.—Asperolite, Demidovite, Llanca, Pechkupfer, Hep-atinerz, Kupferpecherz, Dillenburgerite, Sumervillite, Vert de Cuiver, Kupfergrün, Mountain blue, Mountain green.

114.—Jurinite, Eumanite.

117.—Torberite, Chalkolith, Uranophyllite, Copper-Uranite, Copper Uranium Mica.

120.—Pyrites—radiated, spear, capillary, hepatic, cel-lular, arsenical, cockscomb.

152.—Bog Manganese, Asbolite, Lampadite, Forest Rock.

156.—Zinc Spinel, Automolite, Kreiltonnrite.

141.—Bucklandite, Uralorhite, Bagrationite, Xan-thorhite, Pyrrhite, Erdmannite.

170.—Edelforsite, Okenite, Tafelspath, Schaalstein.

177.—Dichroite, Cordierite, Esmarkite, Aspasolite, Fahlnite, Steinhellite, Iolithe.

180.—Glassy or Sommitte, Dayne, Cavolinite.

185.—Sillimanite, Bucholzite, Monsolite, Bamlite, Xen-olite, Worthite.

187.—Osmelite, Ratholite, Pektolith.

195.—Sismondine, Chloritspath, Barotophyllit.

197.—Mineral Caoutchouc, Subterranean Fungus.

198.—Fossil Copal, Highgate Resin, Retinite Copaline.

SCALE OF HARDNESS.

1 Talc.	5 Apatite.	8 Topaz.
2 Gypsum var.	6 Feldspar.	9 Corundum.
Selenite.	7 Quartz.	10 Diamond.
3 Calcite.	Honestone for streak	
4 Fluorite.	Magnet.	

In box, \$2.00, or without diamond, \$1.00.
Larger sizes to order.

SCALE OF FUSIBILITY.

1 Stibnite.	3 Garnet.	5 Orthoclase.
2 Natrolite.	4 Actinolite.	6 Serpentine.

In box, 25c., larger sizes to order.

Extra Rare and Valuable Books—Mineralogy.

70051. *Aikin A. & C. R. Dictionary of Chem. & Min.*, 4.00; 70824. *Alexander. Manufacture of Iron*, 5.00; 70420. *Bailes. Guide to Coal and Metal Mining*, 3.50; *Beccheri J. J. Physica Subter-ranea et Specimen Beccherianum Stahlil*, 3.50; *Becker. Geol. of Comstock Lode & Washoe Distr.* Text and Atlas, 7.50; 70069. *Bertrand. Diction-naire des Fossiles*, 1.50; 70075. *Beudant. Mineral-ogie*, 3.50; 70084. *Bournon. Traite de Mineral-ogie*, 6.00; 70091. *Bristow. Cat. of Minerals in Museum of King's College, London*, 3.00. *Burn-ham. Limestones and Marbles*, 4.00; *Curtis. Silver-Lead Deposits of Eureka, Nevada*, 1.00; 70138. *Del Rio. Elementos de Orictognosia*, 15.00; *Du-frenoy, Beaumont et al. Voyage Metallurgique en Angleterre*, 10.00; 70109. *Chenevix. Min. Systems*, 1.50; 70513. *Fordyce. Hist. of Coal, Coke, Coal Fields, Iron etc.*, 3.50; 70176. *Greville. Corundum Stone from Asia*, .75; 70532. *Hague & King, Mining Industry*, 20.00; 70185. *Hall. Letters from the East and the West*, 2.00; 70189. *Han-nah. Lime Rocks of Plymouth*, 2.00; 70197. *Hauy. Mineralogie*, 5.00; *Irving. Copper-bearing Rocks of Lake Superior*, 1.50; *Izarn. Lithologie Atmospherique*, 3.50; 70224. *Jameson. Syst. of Min-eralogy*, 1.50; 70228. *Jameson. Min. of Scottish Isles*, 1.50; 70579. *Keeler's. Map of U. S. Terr.*, 2.50; 70240. *Kirwan. Mineralogy*, 1.25; 71003. *Kohn. Iron and Steel Manufacture*, 4.00; *Lesley. Iron Manufacturer's Guide to Furnaces etc. of U. S.*, 2.50; 70598. *Loehnneys. Bericht von Berg-wercken*, 5.00; 70614. *Map of Lake Superior Min. Distr.*, 3.00; 70265. *Mawe. Cat. of Minerals*, 1.00; *Osborn. Metallurgy of Iron and Steel*, 2.50; 70294. *Phillips. Mineralogy*, ed. by Brooke & Miller, 3.50; 70678. *Pumpelly. Iron Ores and Coal Fields of Mo.*, 3.00; 70303. *Rashleigh. Specimens of British Minerals*, 6.00; 70312. *Rivot et Duchanoy. Voyage en Hongrie*, 1.50; *Rosenbusch. Microscopic Physiography of the Rock Making Minerals*, 4.00; 70351. *Sowerby. British Mineralogy*, 15.00; 70364. *Thomson. Out-lines of Mineralogy*, 6.00; 70369. *Townson. Philos. of Mineralogy*, 2.00; 70370. *Townson. Travels in Hungary*, 4.00; 70741. *U. S. Mineral Resources Reports on*, by Brown & Taylor & Ray-mond, complete set, 10.00; 70394. *Werner. Ex-ternal Characters of Fossils*, 2.00; *Zirkel. Micro-scopic Petrography*, 10.00.

See our full list of books on Mineralogy, etc. in March and April LEISURE HOURS, 1889.

Other Collection Lists.—For lists of Gems and Ornamental Stones, Color Series, Specific Gravity Series, Gold, Iron, etc., etc., see April, 1889.

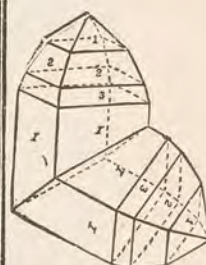
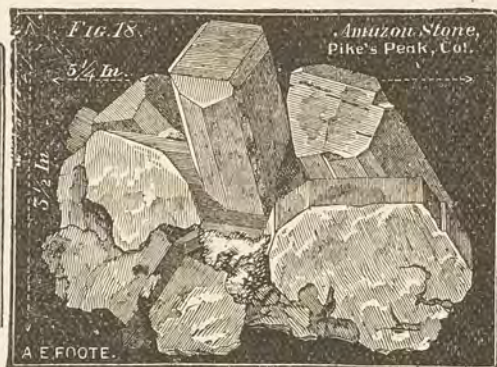
SCIENTIFIC AND MEDICAL BOOKS, MINERALS, A. E. FOOTE, M. D.

No. 1223 Belmont Avenue, Philadelphia, Penna.

(Professor of Chemistry and Mineralogy; Fellow of the American Association for the Advancement of Science and of the American Geological Society; Life Member of the Academy of Nat. Sciences, Phila., and American Museum of Nat. History, Central Park, N. Y. City.)

Specimens sent to any part of the world by mail. Specimen copies of the *NATURALIST'S LEISURE HOUR*, of 32 pages, sent free. Subscription 75 cents a year; for club rates and premiums, see each issue.

I received the highest award given to any one at the Centennial Exposition of 1876, and the only award and medal given to any American for "Collections of Minerals." Over 100 tons and 700,000 specimens in stock.



Twin Crystal Zircon.

My Mineralogical Catalogue or 100 pages is sent post-paid on receipt of 15 cents, heavy paper 25 cents, bound in cloth 50 cents, $\frac{1}{2}$ sheep 75 cents, $\frac{1}{2}$ calf \$1.00, interleaved, each, 25 cents additional; catalogue free to all customers purchasing over \$1.00 worth. (Price-list alone free, or heavy paper 5 cents.) It is profusely illustrated, and the printer and engraver charged me about \$1,000 before a copy was struck off. By means of the table of species and accompanying tables, most species may be verified. The price list is an excellent check list, containing the names of all the species to 1889, and the more common varieties, arranged alphabetically, and preceded by the species number. The species number indicates the place of any mineral in the table of species, where will be found the species name, streak or lustre, cleavage or fracture, hardness, specific gravity, fusibility, and crystallization.

COLLECTIONS OF MINERALS for Students, Amateurs, Professors, Chemists, Physicians et al.

The collections of 100 illustrate the principal species and all the grand subdivisions in Dana's and other Mineralogies; all the principal Ores, &c., &c. The first hundred includes every species in the list advised in Dana's Manual, and some species like Wulfenite, Vivianite, Nitratine, Labradorite, Datolite, Titanite, and Enbolite, that are especially advised by Brush, Nason, Eggleston or other writers on Mineralogy and blowpipe analysis; also other species like Turquoise, Azurite, Microcline and Wavellite that are important. The second hundred includes the remaining varieties advised by Dana, and most species advised in text-books on Mineralogy and blowpipe work.

Our third hundred includes more rare species and varieties. The 300 include nearly all mentioned in large type in Dana's and other text-books on Mineralogy and blowpipe analysis, and a few recent species of much importance not mentioned in them. The collections are labelled with printed labels that can only be removed by soaking. The labels of the Students and higher priced collections give Dana's species number, the name, locality, and in most cases, the composition of the Mineral; the \$1.50 and higher, are also accompanied by my illustrated Catalogue and table of species. The sizes given are average; some smaller, many larger.

NUMBER OF SPECIMENS.

	25 in box.	50 in box.	100 in box.	100	200	300
Crystals and fragments, $\frac{3}{4}$ in.....	\$ 50	\$1 00	\$2 00	\$1 00	\$2 00	\$4 00
Student's size, larger, $1\frac{1}{2} \times 1\frac{1}{2}$ in.....	1 50	3 00	6 00	5 00	10 00	20 00
Amateur's size, $2\frac{3}{4} \times 2$ in.....				10 00	20 00	45 00
High School or Academy size, $2\frac{1}{4} \times 3\frac{1}{2}$ in., Shelf Specimens.....				25 00	50 00	125 00
College size, $3\frac{1}{2} \times 6$ in., Shelf Specimens.....				50 00	100 00	250 00

I am giving special attention to the collection of Literature on the Natural and Physical Sciences—English and Foreign. The list of books in my present Catalogues comprises many rare works. I intend to add every obtainable book, and to enable me to do this, I ask the aid of all, which you can render me in many ways. You can do so by circulating my Catalogue among your friends. You can assist by informing me of any books not in my list, and where I can obtain them, and also of any paper or pamphlet which, though even a local issue, may be of interest to the scientist, or at least worthy of mention in my register of publications.

Many of the scientific men of the country recognizing the advantage of having such an exchange, have placed copies of their papers in my hands for sale on commission. Our lists of scientific books are sent free on light paper, except the 160 page Medical Catalogue, for which we ask 6c. Heavy paper, see page of book abbreviations.

All American books in print supplied on order. Foreign books obtained to order in a few weeks. Of the second-hand books on my list I have generally only single copies, but when sold I replace them as soon as possible.

As any Catalogue must of necessity be a very imperfect list of the books in stock, many scarce works coming in and passing out between the issues—Book Collectors will do well to furnish me with a note of their requirements. When any book inquired for comes to hand, a memorandum, stating description and price will be sent. In our book catalogues the prices opposite the latest number supersede former prices usually where descriptions are the same. My arrangements for noting the needs of my correspondents are nearly perfect.

Over 100,000 pamphlets and papers, many uncatalogued, in stock. Order what you wish and we will get it sooner or later, if we do not have it at the time.

FINALLY AND OF THE MOST IMPORTANCE.—We must especially request our customers to let us know of all mistakes and errors that may occur at our establishment. We can and will gladly rectify them at our own expense.

BOOK ABBREVIATIONS—SUBSCRIPTION LIST.

The details given are fuller than those of most dealers, but the margin charged is so small that to reduce the expense of advertising, the following abbreviations are used:—pp., for pages; $\frac{1}{2}$, or hf., half; hcf., half calf. sp., sheep; hsp., half sheep; hrn., half roan; hmr., half morocco; unb., unbound. p., paper cover; bds., boards; ed., edited, or edition; red., revised edition; l., large; no., number, or numbers; op., out of print; *small; imperfect or incomplete; U. S., United States; v., volume or volumes. In dating, 18 is omitted, as 1879, 79. If no date is given it is usually before 1860. cf., calf; mor., morocco; rn., roan; Rus., Russia; fig., figure or figures; il., illustrations; pl., plates; " for same author, as in preceding number—same, same title except as specified; hrus., half Russia; mrb., marbled; col., colored; 1, nearly new; 2, good as new, except cover; 3, good condition; 4 good except covers 5 good conditions except soiling or staining of a few leaves; 6, good condition except soiling or staining; 7, good except a few leaves torn; 9, good condition, except a few leaves or plates gone. The condition is always specified unless books are just published or there is some defect that would take too much space to specify.

The following abbreviations indicate the publications from which the unb. papers are cut. I thus supply my customers with many valuable monographs that they could not otherwise obtain.

A. Ac., Am. Academy of Arts & Sciences; A. Ent., Am. Entomological Society; Ag., Museum Comparative Zoology; A. I. M., Am. Institute Mining Engineers; A. J., Am. Journal of Science and Arts; Am., Am. Institute; A. M. A., Am. Medical Assoc. Transactions; A. Med., Am. Jour. Medical Sciences; Am. Nat., Am. Naturalist; A. P., Am. Philos. Soc; Ar., Arkansas Survey; Owen; A. S., Am. Assoc. Advancement of Science; B. B., Bulletin, Buffalo Soc; B. Ent., Brooklyn Entomological Society, Bulletin; B., Boston Soc. Nat. Hist. Proc; B. J., Boston Journal of Nat. Hist; Ct., Conn. Agril. Repts; C., Canada Geol. Survey; C. Ent., Canadian Entomologist; Cst., U. S. Coast Surveys; D., Davenport, Academy of Science; Es., Bulletin Essex Inst; E., Emory, Abert, Cook and Johnson, N. Mex. and Cal; Ent., U. S. Ent. Commission; Gl., Gilliss, U. S. Naval Astronomical Exped; H., Hayden's Surv. of the Terr; H. B., Hayd. Bulletins; H. L., H. in Land Office Report; H. M., H. Miscellaneous Papers; Ill., Illinois Agricultural Rept; Ind., Indiana State Sur, Cox; Ks., Kansas Agricultural Repts; Lond., London, Edinburgh & Dublin Philosophical Mag; L., Ludlow, Recon, Black Hills and Yellowstone Park; M. Ag., Mass. Agricultural Report; Mar., Marcy & McClellan's Red River Report; M., Mass., Hitchcock's Zool., Geol; Nat., Nature; N. M., National Museum; Nutt., Bulletin Nuttall Ornithological Soc; N. Y., N. Y. Agricultural Soc; N. Y. A. or N. Y. L., New York Academy Nat. Science; N. Y. Mus., N. York State Museum of Nat. Hist; N. Y. S. N. Y. State Medical Society; O. Ag., Ohio Agricultural Repts; O., Ohio State Sur; Ont., Ontario Agricultural Repts; Ow., Owen, Sur. of Wisc. Iowa & Minn; P. Ag., Penna. Agricultural Repts; Pea Ac., Peabody Academy; P. Ac., Philadelphia Acad. Nat. Sciences; Pea., Peabody Museum; Pow., Powell's Surv; P. R., Pacific R. R. Surv; P. S., Popular Science Monthly; R. S., Proceeding Royal Soc; Sci. Am., Scientific American; S., Sitgreaves, Zuni and Colorado Exped; Sm., Smithsonian Inst. Annual Reports; Sm. M. C., Same, Miscellaneous Collections; Sm. Cont., Same, Contributions; S. L., St. Louis Academy Nat. Sci; St., Stansbury's Salt Lake Expedition; U. S., United States Agric. Reports; Van., Van Nostrand's Electric Engineering Magazine; W., Wheeler's Surv; W. Ac., Wisconsin Acad. Science.

All books cloth, octavo or smaller, unless otherwise specified; 8 is octavo; 4to is quarto; F., French; G., German; L., Latin. To save space, books are numbered by 10s and units; thus 3 is 18453, 2450 being the last ten, etc.

Parties who are prompt in ordering books will almost invariably get what they order, but even if they do not, it is an advantage to them to order, as I am pretty certain to get what they wish, as I am buying more scientific books than any other dealer in the United States. Of course, there are many books so rare that copies are only offered at long intervals. As my books are so low that they go off very rapidly, parties at a distance will do well to send a secondary list to be selected from in case their first choice is already sold. Where a return of money in case of books sold is not specified, it will be held and a special effort made to get the books for customers. Often heretofore a special request to get the books as soon as possible

has been made. My terms are strictly cash in advance unless a satisfactory New York or Philadelphia reference is given.

POSTAGE MUST IN ALL CASES BE PREPAID.—As not one-tenth of my books are sent away by mail, I do not advertise the weight and amount of postage, but books go by weight at 1 cent 2 ounces. Average cost for quartos is 40 cents, for 8 vos. 18 cents, and books whose size is not specified, average 12 cents. I will willingly lay aside books and notify of the postage, when the price or one-third the price is sent in advance. It is better to include 10 cents for registration. Particular attention is called to the lists published each month, indicating the books wanted.

My *Mineralogical Catalogue* of 100 pages is sent post-paid on receipt of 15 cents, heavy paper 25 cents, bound in cloth 50 cents, $\frac{1}{2}$ sheep 75 cents, $\frac{1}{2}$ calf \$1.00, cloth interleaved \$1.00, $\frac{1}{2}$ sheep interleaved \$1.25, $\frac{1}{2}$ calf interleaved \$1.50. Price list alone, 32 pp., 6 cents.

Catalogues of Botanical, Chemical, Entomological, Microscopical, Conchological, Ornithological, Ichthyological, Physical, and other scientific books, 32 pp., free, or heavy paper.....10

Medical, 160 pp., 6c cents, or heavy paper, 25 cents.

Geological, Zoological, Americana, each 64 pp., free, or heavy paper.....15

Where parties are willing to pay a little higher than my catalogue price, I can frequently get the books for them at the New York and Philadelphia stores. When parties are ordering books of me, they can have other books sent in the same package, at about cost; any book that is on sale in New York or Philadelphia, procured, packed and shipped at dealers' regular retail rates, without charge. Subscriptions taken for all scientific periodicals, at regular or club rates.

It is believed that the prices on scientific and medical books are from a half to a third lower than those of any one else making a specialty of them. They are much lower than those of most dealers, even if they do not catalogue.

CLUB RATES ON LEISURE HOUR.

Single subscription 75 cents with premium of 25 cent specimen when requested. All club subscriptions receive the premium, and persons getting up clubs are advised to send in names as fast as they get them, as the receipt of the paper encourages others to subscribe.

Club of 3 subscribers, \$1.50. 5 subscribers, \$2.00.
10 subscribers, \$4.00. 20 subscribers, \$7.50.

Thus a club of 20 subscribers and \$7.50 would be entitled to \$5.00 worth of premiums.

The following club rates can be given where two or more of the journals are taken. On all journals whose club price is over \$3.00, an additional 25 cent specimen will be sent; and on all over \$4.00, an additional 50 cent specimen will be sent when requested.

American Agriculturist, Monthly.....	\$1 25
American Chemical Review and Journal of Sugar and Vinegar Industry.....	4 25
American Chemical Journal.....	2 65
American Engineer.....	3 25
American Journal Medical Sciences.....	3 60
American Journal of Science and Arts, Monthly.....	5 00
American Geologist.....	2 75
American Journal of Insanity.....	4 20
American Machinist, Weekly.....	3 50
American Monthly Microscopical Journal.....	1 00
American Naturalist, Monthly.....	3 75
Bulletin Torrey, Botanical Club, Monthly.....	1 00
Chemical News.....	4 50
Chemical Society's Journal, London.....	8 00
Canadian Entomologist, Monthly.....	95
Electrical World.....	2 50
Engineering and Mining Journal, Weekly.....	3 50
Journal of Microscopy.....	4 50
Journal of Physiology, at Intervals.....	2 00
Journal of Society of Chemical Industry.....	8 00
Medical News.....	4 50
Medical Times.....	1 75
Nature, Weekly.....	5 50
Obstetric Gazette.....	2 75
Popular Science Monthly.....	4 40
Popular Science News.....	95
Sanitarian, Monthly.....	2 75
Science, Weekly.....	3 25
Scientific American, Weekly.....	2 75
Scientific American, Supplement, Weekly.....	4 20

Club rates on any other Scientific, Medical, Agricultural, Horticultural, or Educational Journal from 5 per cent. to 15 per cent. off regular rate.

Mineralogy—Text Books, Essays, etc.

(See Special Heads for—Am. Local Mineralogy, including U.S., Canada, and Mexico; Description of New Species; Gems and Ornamental Stones; Iron and Steel; Gold and Silver; Copper; Zinc, Lead, and Tin; Coal and Coal Oil; Mining; Metallurgy; Meteorites; Crystallography; Lithology; Assaying and Blow-pipe Analysis; Biography; Proceed. of Soc. and Journals; Water, etc.)

- 70050 Aikin A. Manual of Mineralogy. 224pp. 8. bds. 1814, 2, .50; or 2d ed. 271pp. 1815, 2, .50
- 1 " & C. R. Dictionary of Chemistry and Mineralogy. 2 vol. 1212pp. 15 pl. 142 fig. 4to. hcf. 1807, 1, 4.00
- 2 Alger F. Elementary Treatise on Mineralogy. 812pp. 600 il. 1846, 1, rare, 2.00
- 3 Allan R. Manual of Mineralogy. 424pp. 14 pl. 174 fig. 8. bds. Edinburgh 1834, 2, 1.00
- 4 " Mineralogical Nomenclature, with Synoptic Tables of Analyses. 240pp. 8. bds. 1814, 2, rare, 1.25
- 5 " Review of the Above. 8. unb. 1817, 1, .10
- 6 Ansted D. T. Elementary Course of Geology, Mineralogy and Phys. Geography. 611pp. 244 il. 1850, 2, .75
- 7 Apjohn J. Descriptive Cat. of Simple Minerals in Coll. of Trinity College Dublin. 344pp. 8. 1850, 1, 1.50
- 8 " Ross Hill, Ireland, Minerals. 8. unb. '61, 1, .20
- 9 Arragonite. Change to Calc. Spar. 8. unb. '31, 1, .25
- 70060 Art and Sciences of the World, being a Complete Course of Technical Education and General Scientific Information, ed. by J. Wyde. 2 vol. 1319pp. 16 port. (Davv, Faraday, Watt, Bessemer, Lesseps, et al.) 26 pl. 885 il. 4to. p. new, pub. at \$11.50, 2.00
- 1 Baer W. Ueber den Pimelit. 8. unb. '52, G. 1, .25
- 2 Bailey. Mineral & Petrographic News. 8. st. '87, 1, .10
- 3 Bauerman H. Text Book of Systematic Mineralogy. 373pp. 373 il. 1881, new, 2.00
- 4 Descriptive Mineralogy. 405pp. 237 il. '84, new, 2.00
- 5 Bergmann I. Sciagraphia Regni Mineralis. 165pp. 8. stitched, 1783, 1, 1.50
- 6 " Physical and Chemical Essays, with Notes by Cullen. 2 vol. 1026pp. 5 pl. 48 fig. 8. cf. 1784, 2, 2.00
- 7 Berthier P. Memoires et Notices Mineralogiques etc. 209pp. 8. p. 1827, F. 2, 1.50
- 8 " Phosphate of Lime of Coal Formation. 8. unb. '26, 1, .15
- 9 Bertrand E. Dictionnaire des Fossiles Propres et des Fossiles Accidents. 2 vol. in 1.566pp. 8. cf. 1763, F. 2, 1.50
- 70070 " Papers. 8. p. 1. Law of Twinning and Hemihedrism of Leucophane. il. '77, 10; Ungewöhnliche Form des Chlornatriums, etc. pl. 5 fig. G. 78, .30
- 1 Berzelius J. J. Syst. of Mineralogy founded on the Electro-Chem. Theory etc. 138pp. 8. 1814, 1, 1.00
- 2 " Review of the above. 16pp. 8. unb. 1817, 1, .10
- 3 " Analysis of Pyroxenes, Mica etc. 25pp. 8. unb. 21, 1, .25
- 4 " Chem. Composition, and Brewster. Optical Analysis of Minerals of the Zeolite Family. 18pp. 8. unb. '22, 1, .20
- 5 Beudant F. S. Traite Elementaire de Mineralogie. 2 vol. Text. 155pp. 8. hcf. 1832, F. 2, and Atlas. 24 pl. 1452 fig. (many col.) folio, hcf. 3.50
- 6 " Mineralogie et Geol. 655pp. 858 il. hmo. 157, F. 1, 1.25
- 7 " Watron Lakes of Hungary, Pitchstone of Saxony, and Min. School of Freiberg. 16pp. 8. unb. 1822, 1, .15
- 8 Bindheim. Mineralogische Nachrichten aus Daurien. 4 il. 4to. unb. 1796. G. 1, .50
- 9 Bingley W. Useful Knowledge or Account of Various Productions of Nature, Mineral, Vegetable & Animal. 2 vol. 953pp. 9 pl. 84 fig. 151 il. 1842, 1, 1.00
- 70080 Blum J. R. Oryctognosie. 509pp. 261 il. 8. bds. G. 73, 1, 1.00
- 1 Bolton H. C. Papers. 8. p. 1. Literature of Manganese. 41pp. 76, 15; Action of Iodine on Nat. Sulphides. '77, .20; Behavior of Minerals with Citric Acid. '80, .10
- 2 Bonnard A. H. de. Filon. 59pp. 8. stitched, F. 1, .50
- 3 Borch Comte de. Mineralogie Sicilienne et Minerhydrologie Sicilienne. 342pp. 13 tables. 8. p. 1780, F. 2, .75
- 4 Bournon Comte de. Traite de Mineralogie. L'Introduction, Theorie de la Crystallization, l'Etude de la Chaux Carbonatee et de l'Arragonite. 3 vol. 849pp. 72 pl. 899 fig. 4to. London 1808, F. 2, 6.00
- 5 Brande W. T. Descript. Cat. of British Specimens in Geol. Coll. of Royal Inst. 228pp. 8. hcf. 1816, 1, 1.25
- 6 Brendl J. Chemische Zusammensetzung der Mineralien der Krysolithgruppe. 8. unb. 1882, G. 1, .25
- 7 Brard O. P. Mineralogie. 697pp. pl. hcf. '24, F. 2, 1.00
- 8 Breithaupt A. Handbuch der Mineralogie. Band 1. Allgemeiner Theil. 440p. pl. 163 fig. 8. hcf. '36, G. 1, 1.50
- 9 " Papers. 8. unb. 1. Achmite, Hyalosiderite & Trachylite. '26, 15; Osmelite, Cobalt Pyrites etc. '27, .20
- 70090 Brewster D. Papers. 8. unb. 1. Difference between Optical Properties of Aragonite & Calcareous Spar. 18, 15; Struct. of Apophyllite and other Minerals. 19, 15; Phosphorences of Minerals. '19, 10; Optical Properties etc. of Amber. '20, 15; Comptonite from

- Vesuvius. il. '21, 15; Hydrate of Magnesia from Shetland. '21, 10; Connection between Optical Const. and Chem. Composition of Minerals. '21, 10; Existence of Two Fluids in the Cavities of Minerals. pl. '23, 25; Movable Crystals of Carbonate of Lime in a Fluid Cavity of Quartz. '23, 15; Reply to Brooke's Obs. on Connection between Optical Struct. of Minerals and their Primitive Forms. '23, 25; New Species of Double Refraction accompanying remarkable Struct. in Analcime. 2 il. '24, 15; Pyro-Electricity of Minerals. '26, 15; Refractive Power of Fluids in Minerals. 17pp. '26, .25
- 1 Bristow H. W. Cat. of Minerals in Museum of King's College, London. 65pp. 8. hcf. 1842, 2, 3.00
- 2 " Glossary of Mineralogy. 467pp. 475 il. '61, new, 3.00
- 3 Brochant A. J. M. Traite Elementaire de Mineralogie. 2 vol. 1318pp. pl. 24 fig. 18 tables. 8. hcf. 1802, 2, 1.25
- 4 Broegger & Rensch. Apatite in Norway. 19pp. 8. unb. '78, 1, .20
- 5 Broegger & vom Rath. Large Crystals of Enstatite from South Norway. pl. 13 fig. 8. unb. '76, 1, .25
- 6 Brongniart A. Traite de Mineralogie avec des Applications aux Arts. 2 vol. 1019pp. 16 pl. 189 fig. sp. 1807, F. 2, 1.00
- 7 " Arborizations in Dendritic Calcedony or Mocha Stone. 8. unb. 1828, 1, .20
- 8 Brooke H. J. Papers. 8. unb. 1. Comptonite of Vesuvius, Brewsterite of Scotland, Silbite etc. pl. 9 fig. '22, 15; Mengite; Aeschelite, Sarcosite as distinct from Analcime and Gmelinite etc. 4 il. '31, .25; Monticellite, Zoizite etc. 8 il. '31, '20; Poonahite etc. '31, 15; Brewster's Reply to Brooke's Obs. on "Optical Syst. of Mineralogy." 17pp. 24, 15; Haidinger's "Crystalline Sulpho-tri-carbonate of Lead." '24, .15
- 9 Brush. Progress of Am. Mineralogy. 42pp. Sp. '82, 1, .25
- 70100 Buckland W. Geology and Mineralogy with Reference to Nat. Theology. 2 vol. 770pp. 64 pl. nearly 600 fig. 5 sect. 8. hcf. 2d Pickering ed. 1837, fine copy, 2.00; or Am. Ed. 2 vol. 574pp. 64 pl. 5 sect. 8. 1837, 3, .60
- 1 Campbell. Mineralogy of S. India. 22pp. 8. unb. '45, 1, .20
- 2 Catalogue of Mineralogical Collection of the Literary and Hist. Soc. of Quebec. 72pp. 8. helioth. n. d. 1, 1.00
- 3 Catalogue and Analysis of Specimens added to the Cabinet of U.S. Naval Academy. 41pp. 8. p. '81, 1, .20
- 4 Calcedony Park, Arizona. 14pp. 2 pl. 8. p. 1, .10
- 5 " Cat. of Specimens etc. 45pp. 4to. p. 1, .20
- 6 Chandler. Anal. of Rare Minerals. 52pp. 8. p. '57, 1, 1.00
- 7 Chapman E. J. Practical Mineralogy. 205pp. 13 pl. 270 fig. 8. London 1843, 1, 1.00
- 8 " Mimeticism in Inorganic Nature. 4to. st. '84, 1, .10
- 9 Chenevix R. Observations on Mineralogical Systems. 146pp. 8. stitched, London 1811, 1, 1.50
- 70110 Chester A. H. Cat. of Minerals. 52pp. 8. '86, new, 1.00; or 1, .75
- 1 " Fuchsite, Zinkenite, Pectolite etc. il. 8. p. '87, 1, .10
- 2 Cleaveland P. Mineralogy and Geology. 680pp. col. geol. map, 5 pl. 159 fig. 8. hcf. Boston 1816, 2, 1.00
- 3 " Review of Above. 18pp. A. J. 1818, .15
- 4 Collins J. H. Mineralogy. Vol. 1. General Principles of Mineralogy. 206pp. 379 il. 1877, 1, .75
- 5 " First Book of Mineralogy. 160pp. 159 il. '73, new, .20
- 6 " Cat. of Metallic Minerals in Museum of Royal Institution of Cornwall. 54pp. 8. p. 1881, 1, .20
- 7 Comstock J. L. Elements of Mineralogy. 414pp. il. 8. cf. Boston 1827, 2, .50
- 8 " Introduction to Mineralogy. 343pp. 186 il. cf. 2d ed. 1834, 2, 25; or 12th ed. 369pp. 186 il. sh. 1845, 3, .20
- 9 Crosby. Common Minerals & Rocks. 131pp. p. '83, new, 1.00
- 70120 Connell A. Papers of Analyses. 8. unb. 1. Species of Zeolite Family from Scotland. '29, 25; Brewsterite. '30, .20; Harmotome or Cross-stone. '32, 20; Sillimanite. '41, 20; Phillipsite. '43, 15; Elie Pyrope or Garnet. '45, .15; American Nemalite. '46, .15
- 1 Cook J. P. Vermiculites. 33pp. 8 il. 8. p. '73, 1, .50
- 2 Cronstedt. System of Mineralogy. 2 vol. 1095pp. 2 pl. 32 fig. 8. cf. 2d ed. London 1788, 2, 2.50
- 3 Da Costa E. M. Nat. Hist. of Fossils. 300pp. pl. 7 fig. 4to. cf. 1757, 1, much on Am. Minerals, 1, 25; or 2, 1.00
- 4 Dana J. D. System of Mineralogy. 686pp. 4 pl. 165 fig. il. 8. sh. orig. ed. with binomial nomenclature. 1837, 1, 1.25; or 2, .75; or 2d ed. 633pp. 4 pl. 165 fig. il. 8. 1844, 1, 2.00; or 3, 1.25; or 3d ed. 711pp. 4 pl. 165 fig. il. 8. 1850, 2.50; or 4th ed. 2 vol. in 1. 853pp. 609 il. 8. '54, 1, 2.00; or 3, 1.50; or 5th ed. 894pp. 616 il. 8. 1873, 1, 6.00; or new 1. ed., 8.00
- 5 " Rev. of above, by B. Silliman. 38pp. 19 il. 8. p. '44, 1, .25
- 6 " Supplements to above, each about 15pp. 8. st. 1, 10 to 20
- 7 " Appendices 1 & 2 to "System of Mineralogy," by G. J. Brush. 95pp. 8. p. 1871 and '75, 1, .20
- 8 " App. 3, by E. S. Dana. 147pp. 8. 1882, new, 1.26
- 9 " New Mineralog. Nomenclature. 26pp. 8. unb. '36, 1, .50
- 70130 " Manual of Mineralogy. 457pp. il. hmo. '66, 1, .50
- 1 " Manual of Min. & Lithology. 482pp. 345 il. '78, 1, 1.27

- 2 "Man. of Min. & Petrography. 526pp. 411 il. '88, new, 1.75
- 3 "E. S. Text-Book of Mineralogy with Treatise on Crystallography & Phys. Min. 493pp. col. pl. 827 il. S. '80, 1.20
- 4 "Progress in Mineralogy. S. p. new. '82. 17pp.; '83. 19pp.; '84. 19pp.; '85. 26pp. each. .10
- 5 "Ueber den Columbit. il. S. p. 1886, G. 1. .15
- 6 Daubree M. Notice des Travaux de. 24pp. 4to. p. '61, 1.25
- 7 De Lander C. F. Nota Sobre el Sulfotelururo de Bismuto y Plata de la Sierra de Tapalpa. S. st. '85, 1. .15
- 8 Del Rio C. A. Elementos de Orictognosia. 690pp. 24 pl. 265 fig. S. hcf. 1832, 3, Spanish, very rare. 15.00
- 9 "Observations on Shepard's Treatise of Mineralogy. 24pp. S. unib. 1834, 1. .25
- 70149 Dictionnaire de Chimie, de Mineralogie et de Geologie. 493pp. 2 pl. 6 fig. S. hmoir, 1824, F. 1. .60
- 1 Dohrmann A. Cat. of Collection of Minerals of. 56pp. 9 pl. 67 fig. 4to. p. 1886, 1.50, or without pl. .10
- 2 Dolomieu D. de. Mem. sur. les Iles Ponce et Cat. des Produits de l'Etna. 531pp. 4 pl. S. cf. 1788, F. 2. .100
- 3 Dufrenoy A. Traite de Mineralogie. 3 vol. Text, 2185pp. and Vol. Atlas. 224 pl. 1196 fig. S. sh. '25, F. 1. .350
- 4 Eger. Grundriss der Mineralogie. 74pp. pl. p. '78, G. 1. .10
- 5 Egleston T. Cat. of Minerals. 55pp. 8, stitched, '63, 1. .10
- 6 Ehrenberg M. Forms assumed by Uncrystallized Mineral Substances. S. unib. 1841, 1. .20
- 7 Erni H. Mineralogy Simplified. 206pp. 10 il. '67, 4.50; or 2d ed. 335pp. 121 il. 1885, new. 2.40
- 8 Farey. Mineralogy etc. of Derbyshire, England. 3 vol. 1873pp. 3 col. maps, 4 pl. (2 col.) S. bds. 2. .150
- 9 Farrington A. C. Metamorphic Condition of Large Vein of Franklinite in N. J. A. A. S. 1852. .15
- 70150 Faxar. Soda Lake in South Am. S. unib. '17, 1. .10
- 1 Feuchtwanger. Striae on Rock Crystals. A. A. S. '71, 1. .10
- 2 Fleming J. Mineralogy of the Redhead in Angushire. 31pp. S. unib. 1818, 1. .25
- 3 "Formation of Siliceous Stalactites. S. unib. '25, 1. .15
- 4 Fletcher L. Introduction to Study of Minerals & Guide to Mineral Gallery of Brit. Mus. 120pp. 39 il. S. p. '87, 1. .15
- 5 Flight W. Action of Sodium Hydrate and Carbonate on Felspars and Wollastonite. S. p. 1882, 1. .15
- 6 Flink G. Mineralogische Notiser II. (17 to 37) 94pp. 4 pl. 53 fig. S. p. 1888, Swedish, new. .50
- 7 Foote A. E. Mineral Catalogue, with price lists, tables of species and many scientific Monographs, new edition 1889. 100pp. about 40 il. S. p. .15; heavy p. .25; clo. .50; hsp. .75; hcf. 1.00; clo. interleaved, 1.75; hsp. do. 1.00; hcf. do. 1.25; or price list alone, 23pp., free.
- 8 "Mineralogist's Companion 1889. 32pp. a handy book for the pocket. p. 20; cloth. .35; sheep. .60; calf. 1.00; interleaved, 50c. additional.
- 9 Forbes D. Mineralogiske Iagttagelser omkring Arendal og Kragero. 17pp. pl. 15 fig. S. stitched, Swedish, 1. .20
- 70160 Foye. Handbook of Minerals. 180pp. bds. '86, new. .50
- 1 Frazer. Tables of Minerals. 119pp. rn. 1878, new. 1.60
- 2 Frick. Chem. Composition of Clay Slate. S. unib. '37, 1. .15
- 3 Frischmann. Die Zwillinge des Chrysoberylls. Text, pl. 13 fig. S. unib. 1867, G. 1. .25
- 4 Fullon H. v. Minerale u. Gesteine des Arlberg tunnels. 59pp. pl. 5 fig. 13 il. S. unib. 1885, G. 1. .75
- 5 Gages A. Formation of Minerals etc. S. unib. 1863, 1. .75
- 6 Geinitz H. B. Koenigliche Museum zu Dresden. 110pp. 2 pl. (1 col.) p. '58, G. 1. .20; or, 95pp. 2 pl. p. '73, G. 1. .15
- 7 Gellert C. E. Metallurgic Chymistry, being a System of Mineralogy in General and all Arts arising from this Science. 431pp. 4 pl. S. cf. 1776, 3. .200
- 8 Genth F. A. Papers, 8, p. or stitched, 1. Re-examination of the Tetradymite from Field's Gold Mine, Ga. etc. '60, 15; Tetradymite, reply to C. T. Jackson. '61, 15; Whitneyite, Am. Tellurium Minerals etc. 17pp. '68, 15; Am. Tellurium & Bismuth Minerals. '74, 15; Some Tellurium and Vanadium Minerals. '77, 10; Pyrophyllite from Schuylkill Co. Pa. '79, 10; Corundum and its Alterations; Alteration of Talc into Anthophyllite etc. 24pp. '82, 20; Herderite. '84, 10; Tin and Associated Minerals. Joseite and Tetradymite etc. 15pp. '85, 10; Tin Ores in Mex., Cassiterite, Hematite, Mimetite, Vanadinite etc. 22pp. pl. 11 fig. 10 il. '87. .25
- 9 " & vom Rath. Vanadates and Iodyrite from Lake Valley, New Mex. 4 il. S. p. '85, 1. .20; or, unib. .15
- 70170 "Same in German, and "22 Quarze aus Burke Co. N. C." 30pp. pl. 12 fig. S. p. '85, G. 1. .25
- 1 Giesecke Sir C. L. Cat. of New Collection of Minerals in Mus. of Royal Dublin Soc. 23pp. S. '32, 2. .60
- 2 "Papers, S. unib. 1. On Cryolite. il. '22, 15; Cat. of Minerals from the Arctic Regions. 24pp. '61. .35
- 3 Glauber J. R. Miraculum Mundi Plena Perfectaque Vegetabilia, Animalia et Mineralia. 429pp. 3 pl. of furnaces, alembics etc. cf. 1653, L. 2. .150
- 4 Gmelin C. G. Papers, 8, unib. 1. Analysis of a Black Mineral from Candy, Ceylon. '23, 10; Pinite from St. Pardoux, Auvergne. '24, 15; Cinnamon-stone from Ceylon. '24, 15; Analysis of Diopside. '25, 15; Of Helvine. '25, 15; Lithion Mica from Zinnwald, Bohemia. '26, 10; Chem. Examination of Tourmaline. '27, 20; Clinkstone or Phonolite. '29. .10
- 5 " & Brewster. Analysis of Peach-Blossom Mica and its Optical Structure. S. unib. 1825, 1. .15
- 6 Greville C. On the Corundum Stone from Asia. 46pp. pl. 20 fig. 4to. stitched, 1798, 3. .75
- 7 " & Walker. Analysis of Coprolites. S. unib. '35, 1. .15
- 8 Grierson. Mineral Obs. in Galloway. 20pp. S. unib. '18, 1. .25
- 9 Grimes E. Flints of Warwickshire. S. unib. '25, 1. .10
- 70180 Groff G. G. Mineral Analysis. 102pp. S. hcf. '83, 1. .25
- 1 "Mineral Chart of Chester Co. Pa. 18 x 20 inches, 1. .10
- 2 Hague A. Deposition of Scordite from Arsenical Waters in Yellowstone National Park. S. p. '87, 1. .10
- 3 Haidinger W. Mineralogie. 661pp. 763 il. S. p. G. '50, 2.75
- 4 "Papers, S. unib. 1. Series of Crystallization of Apatite. 14pp. pl. 20 fig. '24, 25; Comparison of Series of Crystallization of Epidote and Glauber Salt. 12 il. '24, 15; Sodolite of Vesuvius. 5 il. '25, 20; Remarkable Var. of Boracite. '25, 15; Trona, native Carb. of Soda from Fezzan. '25, 15; Sp. Gr. of several Minerals. 21pp. '25, 25; Manganese Ores. pl. 20 fig. '26, 20; French Locality of Vauquelinite. '27, 15; Mesole. '27. .10
- 5 Hall F. Letters from the East and from the West. (Letters from the Valley of the Connecticut River on Minerals etc.) 179pp. S. 1840, 1. .200
- 6 "T. M. Mineralogist's Directory. Principal Mineral Localities in Gt. Britain & Ireland. 180pp. 1868, 1. .50
- 7 Hallock E. J. Index to the Literature of Titanium 1783 to 1876. 2 Parts. 22pp. N. Y. Lye. '77. .25
- 8 Hamilton. Singraula Corundum Mine. S. unib. '20, 1. .15
- 9 Hannah R. Lime Rocks of Plymouth. 83pp. 11 pl. 42 fig. *4to. bds. Plymouth 1823, 1, one of the earliest books on English Minerals and Fossils. 2.00
- 70190 Harrington B. J. Papers, 8, p. or unib. 1. Notes on Dawsonite. '74, 10; Chrome Garnet, Pyrrhotite etc. '80, 15; Composition of Dawsonite. '81. .10
- 1 Harris. Crude Borax from Cal. A. P. 1864. .10
- 2 Hartman C. Mineralogical Notices. il. S. unib. '27, 1. .20
- 3 Hartwall. Fergusonite, Epidote etc. S. unib. '30, 1. .20
- 4 Harvey. Minerals & Rocks of Ark. 32pp. il. S. p. '86, 1. .10
- 5 Haughton S. Papers, 8, unib. 1. Min. Excursion from Cairo into Arabia Petraea & Min. Desc. of Rocks from Nagpur, India. 21pp. 3 pl. '59, 35; Nickeliferous Pyrites from Tiernakill, Ireland. '61. .15
- 6 Haushofer K. Verhalten des Dolomit gegen Essigsauere. 18pp. S. unib. 1881, G. 1. .25
- 7 Hauy. Traite de Mineralogie. 4 vol. 2347pp. S. hcf. 1801, 2, and Atlas. 14pp. 86 pl. 772 fig. oblong, bds 1. .500
- 8 "United States & other Tourmalines. S. unib. '17, 1. .25
- 9 Hayes A. A. Wide Diffusion of Vanadium and its Association with Phosphorus. S. unib. 1875, 1. .20
- 70200 Hayden. Collection of Minerals. 20pp. S. p. '83, 1. .10
- 1 Hedinger J. M. Castleton in Derbyshire. Natural Curiosities and Mineral Productions. 37pp. pl. p. '15, 2. .20
- 2 Henckel. Pyritologia; A History of the Pyrites. 399pp. pl. S. cf. London 1767, 2, very rare. 5.00
- 3 Hermann. Analysis of Pyrophyllite. S. unib. '30, 1. .20
- 4 Herschel & Brewster. Peculiarity in Refraction of differently colored Rays in Apophyllite. S. unib. '22, 1. .15
- 5 Hertel. Kalk und Gyps. 461pp. 9 pl. 75 fig. G. 1. .35
- 6 Hill J. Natural History of Fossils. 664pp. table, 11 pl. 387 fig. folio, hcf. 1748, 2. 6.00
- 7 "Rev. of Works of Royal Soc. of London. 274pp. 4to. cf. 1751, 1 (75pp. devoted to Minerals), 150; or 3. .50
- 8 Hooker W. Mineralogy & Geol. 380pp. 181 il. hbn. '65, 1. .50
- 9 Hope T. C. Mineral from Strontian and Peculiar Species of Earth it contains. 39pp. 4to. cf. 1793, 2. .150
- 70210 How Prof. Papers, 8, stitched, 1. Nova Scotia Pickeringite. '63, 15; New Forms of Borates in Gypsum, etc. '70. .20
- 1 Howe. Nomenclature for Minerals. 16pp. A. I. M. '83, 15
- 2 Hubbard. Rutile & Chlorite in Quartz. il. A. A. S. '51, 10
- 3 Humble W. Dictionary of Mineralogy and Geology. 477pp. S. London 1860, 1. .75
- 4 Hunt T. S. Mineral Physiology and Physiography. 700pp. S. 1887, new. 4.00
- 4a "Chemical & Geol. Essays. 511pp. S. 1875, 1. 2.50
- 5 "Natural System of Mineralogy with Classification of Native Silicates. 123pp. S. p. 1. .75
- 6 "Papers, 8, p. or unib. 1. Mineralogy of certain Organic Remains from Can. Laurentian Rocks. '64, 15; Object & Method of Mineralogy. '67, 20; Mineral Physiology. 21pp. '82, 25; Classification and Nomenclature of Metalline Minerals. '88. .15
- 7 Hutton T. Notes on the Mineralogy and Geology of Afghanistan. 50pp. S. unib. 1846, 1. .35
- 8 Hydrargillite, Barsowite etc. S. unib. 1840, 1. .15
- 9 Ignatius. Index Fossilium. 160pp. 3 pl. 35 fig. 15 il. bds. Prague 1772, L. 2, rare. 1.50

- 70220 Jackson A. W. Mineralogical Contributions. Colemanite, Pyrite & Albite etc. 17 pp. 4 pl. 20 fig. s.p. '86, 1, 75
- 1 " Morphology of Colemanite, & Evans. Chem. Properties & Rela. of Colemanite. 40 pp. 4 pl. 19 fig. s.p. '85, 1, 60
- 2 " C.T. Papers, S. st. 1. Artificial Minerals from an Iron Furnace. A.A.S. '51, 10. Emery, Chester, Mass. '64, 10
- 3 Jacques & Currie. Liberation of Electricity in Tourmaline by Pressure. 8. unb. 1881, 1, 15
- 4 James E. Pumice of Mo. identical with Amygdaloid found near the Rocky Mts. N.Y. Lyc. 1824, 50
- 5 Jameson R. System of Mineralogy. 3 vol. 1669 pp. 13 pl. 272 fig. s. cf. Edinburgh 1816, 2, 150
- 6 " Manual of Mineralogy. 555 pp. 8. cf. 1821, 2, 125
- 7 " External Characters of Minerals. 122 pp. 2 pl. 35 fig. 8. stitched, orig. ed. 1805, 1, 125; or 3d ed. 329 pp. 8 pl. 87 fig. 8. bds. Edinburgh 1817, 2, 100
- 8 " Mineralogy of the Scottish Isles. 2 vol. in 1. 562 pp. 4 maps, 9 pl. 11. 4to. hef. 1809, 2, 150; or Vol. 2, alone, 50
- 8a " Tabular View of Arrangement of Minerals found upon Phys. & Chem. Characters. 23 pp. 8. unb. '41, 1, 25
- 9 " Graphite of Ayrshire etc. 8. unb. 1819, 1, 15
- 70230 Johnson, Houghton of Prof. Shepard, H.A.S. '52, 15
- 1 Joly J. Papers, S. p. 1. Specific Heat of Minerals. 25 pp. '86, 20; Harmotome at Glendalough, Ireland. 11. '86, 20
- 2 Joy, Exam. for Thallium & Indium. N.Y. L. '66, 10
- 3 Karsten D. L. G. Description of Minerals in the Leshian Museum. 2 vol. in 1. 687 pp. 8. cf. 1798, 1, 100
- 4 " Mineralogische Beschreibung der Gegend um Benndorf etc. 23 pp. 4to. unb. 1796, G. 1, 35
- 5 " W.J.G. Naturwissenschaft, ihr chymisch-mineralogischer Theil. 574 pp. 8 pl. hef. G. 1785, 2, 100
- 6 Keating W. H. Syllabus of a Course of Mineralogy and Chemistry. 8. stitched, 1822, 3, 35
- 7 Kendall, Minerals and Fossils of Scarborough. 316 pp. 3 col. pl. 8. bds. 1816, 2, rare, 200
- 8 Kennigott A. Uebersicht der Resultate Mineralogischer Forschungen in 1860. 22 pp. 8. p. 1862, G. 1, 50
- 9 Kidd J. Outlines of Mineralogy. 2 vol. in 1. 571 pp. 8. hef. Oxford 1809, 2, 150
- 70240 Kirwan R. Elements of Mineralogy. 2 vol. 1082 pp. 8. cf. 2d ed. 1794 to '96, 2, 125; or 3d ed. 949 pp. 8. hef. 1810, 2, 150
- 1 Klaproth M. Chemical Knowledge of Mineral Substances. 2 vol. in 1. 874 pp. 8. hef. London 1801, 2, 150
- 2 Klette, Anatas u. Brookit von Wolfshau bei Schmiedeburg, Schlesien. 8. unb. 1855, G. 1, 25
- 3 Kobell F. v. Tafeln zur Bestimmung der Mineralien. 128 pp. 8. p. G. 1864, 1, 100
- 4 " Sketches from the Mineral Kingdom, and Schouw. Earth, Plants & Man. 402 pp. col. map, '52, 2, 75
- 5 " Okenite, Compact Garnet etc. 8. unb. '29, 1, 15
- 6 " Papers, S. unb. G. 1. Verhalten des Disthen im Stauroskop. pl. 9 fig. '67, 35; Glaukodot von Hokansbo. '67, 23; Montebasit. '72, 15
- 7 Koenig G. A. Papers, A. P. Astrophyllite, Arfvedsonite and Zircon from El Paso. 11. '77, 10; Alaskait. '81, 10; Gosallite, Alaskait and Begerite. '85, 10; Eleonorite from Sevier Co. Ark. p. Ac. '88, 10
- 8 " Ueber Alaskait. 8. stitched, G. 1885, 1, 15
- 9 Kohnm B. Apatit von Ofenheim u. Kalkwavelit von Dohrn u. Ahlbach. 8. unb. 1868, G. 1, 30
- 70250 Kupffer R. Remarkable Law in Min. 8. unb. '26, 1, 10
- 1 Leonhard K. C. v. Handbuch der Oryktognosie. 762 pp. 7 pl. 95 fig. 8. bds. 1821, G. 2, 100
- 2 " Naturgesch. des Steinsreichs. 438 pp. 11. unb. '54, 1, 60
- 3 " G. Mineralogie. 424 pp. 6 pl. 24 il. 8. '60, G. 1, 75
- 4 Leonhard, Kopp u. Gaertner. Propädeutik der Mineralogie. 327 pp. 10 pl. (3 col.) 481 fig. folio, cf. G. '17, 2, 250
- 5 Levy A. Papers, S. unb. 1. Description of Eudalite. 11. '25, 15; On Euclase. p. 7 fig. '26, 35; Murchisonite. 11. '27, 15; Forms of Wagnerite. '27, 15; Identity of Epidalite and Heulandite. '27, 15
- 5a Lewis H. C. Papers, P. A. Optical Characters of some Micas. 11. '80, 10; Dendrites. '80, 10; Pseudomorphs of Serpentine after Dolomite. '82, 15; Mineral resembling Dolomite from Peat Bed at Scranton. '82, 15; Cacoclasite, a new species, (see also A. E. Foote's Cat. '89, p. '82, 15; Aquacrepitite. '82, 10; 28 Monthly Min. Notices. 1882 to '84, 114 pp. 11. 150; Biography of, with complete Bibliography. port. '18, 15
- 6 Liversidge A. Papers, S. p. 1. Stilbite from Kerguelen Isl. 11. '16; Some New So. Wales Minerals. 2 pl. 3 il. '85, 50
- 7 Lobley J. L. Mount Vesuvius, Geology. List of Minerals etc. 62 pp. pl. col. map, sect. 8. p. 1868, 1, 50
- 8 Lord. Lithia in Ohio Fire Clays. A. I. M. '84, 10
- 9 Lowrie D. Conversations on Mineralogy. 2 vol. 560 pp. 12 pl. (1 col.) 417 fig. bds. London 1822, 2, 75; or Am. ed. 343 pp. 12 pl. (1 col.) 417 fig. cf. Phila. 1822, 2, 65
- 70260 McCay, Kobalt-Nickel u. Eisenkiese. 46 pp. 8. p. '83, 1, 20
- 1 Mahon. Mineral Agent's Handbook. 66 pp. 8. 1, 60
- 2 Marguerite. Chem. Const. of Wolfram. 8. unb. '44, 1, 15
- 3 Martin D. S. Minerals and Methods of Studying them. 19 pp. 8. p. 1864, 1, 25
- 4 Mawe J. Familiar Lessons on Mineralogy and Geol. 104 pp. 3 pl. (2 col.) 27 fig. hef. 1820, 2, 50; or 116 pp. 4 col. pl. 32 fig. bds. 1826, 2, 75
- 5 " Descriptive Catalogue of Minerals. 113 pp. pl. interleaved, bds. 1816, 2, 100
- 6 " Mineralogy of Derbyshire, with Glossary of Terms. 226 pp. map, 2 pl. 8. cf. 1802, 2, 200
- 7 " Tourmaline & Apatite of Devonshire. 8. unb. '18, 1, 10
- 8 Mell. Southern Soapstones, Kaolin etc. A.I.M., 15
- 9 Menge J. Mineralogical Journey through Iceland. pl. 5 fig. 8. unb. 1820, 1, 20
- 70270 Obs. on above by Mackenzie. 8. unb. 1820, 1, 10
- 1 Miargyrite and Jamesonite. 8. unb. '30, 1, 20
- 2 Miers. Hemihedrism of Cuprite. pl. 5 fig. 8. p. '84, 1, 20
- 3 Mineralogical Report respecting Elba. 8. unb. '20, 1, 10
- 4 Mitscherlich A. Untersuchung des Alaunsteines und Lœwigites. 11. 8. unb. 1862, G. 1, 25
- 5 Mohs F. Treatise on Mineralogy. 3 vol. 1274 pp. col. geol. map of England, 35 pl. 197 fig. 1825, 1, 350
- 6 " General Reflections on Various important Subjects in Mineralogy. 42 pp. 8. unb. 1825, 1, 30
- 7 Moore N. F. Ancient Mineralogy. 192 pp. 1834, 1, 35
- 8 Moxon. Introduct. to Mineralogy. 82 pp. 8. bds. '38, 1, 100
- 9 Naumann C. F. Elemente der Mineralogie. 581 pp. 796 il. 8. hrn. 1868, G. 1, 150
- 70280 " Mineralog. Classification. 20 pp. 8. unb. '45, 1, 20
- 1 Necker L. A. Mineralogy as a Branch of Nat. Hist. & Outlines of an Arrangement of Minerals on Principles of Natural Method. 57 pp. 8. unb. '32, 1, 50
- 2 " Rare Scottish Minerals. 8. unb. '40, 1, 20
- 3 Neumann Prof. Krystall System des Albites u. der ihm verwandten Gattungen. 42 pp. 11. 4to. unb. '30, G. 1, 75
- 4 New Alkali (Lithia) found in Sweden. 8. unb. '18, 1, 10
- 5 Nevill W. Descriptive Catalogue of Minerals in his Collection. 179 pp. 4to. London 1872, 1, 75
- 6 New South Wales. Description of Minerals of, by A. Liversidge; Mineral Products, by H. Wood etc. 345 pp. 5 col. maps and diagrams, 4to. p. '82, 1, 75
- 7 Nicol J. Manual of Mineralogy. 600 pp. 250 il. '49, 1, 200
- 8 " Papers, S. unb. 1. Zircon of Island of Scalpay. '26, 20; Fluids in crystallized Minerals. '28, 20
- 9 Noellner. Ueber Lueneburgit. 8. unb. G. '70, 1, 25
- 70290 Ossan C. Russian Platina. 8. unb. 1827, 1, 15
- 2 Pargasite. Description of. 8. unb. 1818, 1, 10
- 3 Phillips W. Outlines of Mineralogy and Geology. 183 pp. 4 pl. bds. orig. ed. 1813, 2, 35; or 4th ed. with Methods of Mining in Cornwall. 305 pp. pl. 11. 8. bds. '25, 2, 50
- 4 " Elementary Introduction to Mineralogy. 540 pp. pl. 56 fig. 11. 8. sh. 3d ed. '23, 2, 50; or 6th ed. with Additions by F. Alger. 810 pp. 600 il. 8. 1844, 1, 125; or new ed. by Brooke & Miller. 707 pp. 647 il. 8. '52, 1, 350
- 5 " Cat. of Minerals in Cabinet of. 86 pp. 8. p. '29, 1, 250
- 5a " Papers, S. unb. 1. Crystalline Form of Gay-Lussite. 311. '27, 15; Crystalline Form of Sillimanite. 11. '27, 13; Remarkable Crystals of Quartz. 11. '27, 10; Crystal. Forms of Nat. & Artificial Sulphur of Bismuth. 11. '27, 15
- 6 Phipson T. L. Phosphorescence or Emission of Light by Minerals, Plants etc. 225 pp. pl. 29 il. 1869, 1, 50
- 7 Phosphoric Acid in Simple Minerals etc. 8. unb. '45, 1, 15
- 8 Poey D. F. Mineralogia. 295 pp. 4 pl. 8. hef. '78, 1, 8, 100
- 9 Pryce W. Minerals, Mines and Mining. 378 pp. 3 pl. folio, bds. London 1778, 2, 500
- 70300 Rammelsberg C. F. Handwörterbuch des Chemischen Theils der Mineralogie. 2 vol. and Suppl. 1, in 1 vol. 970 pp. 8. hef. '41 to '43, G. 1, 150; or Vol. 1 A to M. 478 pp. 8. hef. 1, 65
- 1 Rampasse. Min. Account of Corsica. 8. unb. '08, 1, 15
- 2 Ramsay A. Rudiments of Mineralogy. 338 pp. 2 pl. 65 fig. 65 il. 1868, 2, 60
- 3 Rashleigh P. Specimens of British Minerals selected from his Cabinet. 88 pp. 74 col. pl. 312 fig. 4to. hef. London 1797, 2, only about 100 copies printed, 600
- 4 Rath G. vom. Mineralog. Notizen; Quarz aus N.C., Stephanit aus Mex. etc. 53 pp. 2 pl. 24 fig. 8. p. '85, G. 1, 60
- 5 " Geognostisch-Mineralogische Beobachtungen im Rhein Quellgebiet. 145 pp. 4 pl. (1 col.) 8. unb. '62, G. 1, 100
- 6 " Geologische Briefe aus America. 76 pp. 11. 8. p. '84, 1, much on Mineralogy, 50
- 7 " Papers, S. p. or unb. G. 1. Tridymit aus Neuseeland etc. 11. '81, 20; Extracts from Notes on the Bement Collection of Minerals. 11. '86, 10
- 8 Reinegg. Sea Froth (Meerschäum). 8. unb. 1799, 1, 15
- 9 Reuss Dr. Mineralogische Bemerkungen auf einer Reise nach Carlsbad. 36 pp. 4to. unb. 1796, G. 1, 50
- 70310 Richards. 1st Lesson in Mineralogy. 32 pp. p. '82, 1, 15
- 1 " Reactions of Titanium. A.J.M. 1882, 10
- 2 Rivot et Duchanoy. Voyage en Hongrie, 1851. 243 pp. 8. p. '53, F. 1, entirely on Minerals, 150

- 3 Rockwell G. J. Index to the Literature of Vanadium, 1801 to 1877. 14pp. N. Y. Lye. 1878. .25
- 4 Rose G. Polybasite & Zinkenite. 8. unb. 1830, 1. .25
- 5 "Felspar, Albite, Labradorite etc. 8. unb. '24, 1. .10
- 6 "De Novis Quibusdam Fossilibus quae in Montibus Uralis inveniuntur. il. 4to. stitched. L. '30, 3. .50
- 7 Rosenbusch Dr. Mineralogische u. Geognost. Notizen von Sued Brasilien. 40pp. pl. 5 fig. 8. unb. '70, G. 1. .35
- 8 Rumphius G. E. Thesaurus Cochlearum et Mineralia. 280pp. port. 60 pl. 661 fig. folio. cf. 1739, 3. .400
- 9 Russia. Special Cat. of Articles of Imperial Mining Deptmt. at Internat. Exhibition. 112pp. pl. 8. p. '76, 1. .50
- 70320 "List of Minerals selected from Coll. of Mus. of Mining School for the Phila. Exhibition. 8. p. '76, 1. .25
- 1 Rutley F. Mineralogy. 224pp. 67 il. bds. 1874, 2. .25
- 2 Rutty J. Essay towards a Natural History of the County of Dublin. 2 vol. 899pp. (over 1000pp. devoted to minerals, etc.) map, 3 pl. 8. hcf. 1772, 3. .200
- 3 Sack A. L. Ueber einen Rhodocrinites verus im Crystallisirten Flussspath. 8. unb. 1850, G. 1. .25
- 4 Sage, Use of Amianthus in China. 8. unb. 1805, 1. .10
- 5 St. Fond F. Geol. Journey to Mt. Ramazzo in the Appennines. Disc. of Variolite, Arragonite etc. 8. unb. '08, 1. .15
- 6 Sandberger F. Papers, 8. unb. G. 1. Rammelsbergit. '71, .15; Lithionglimmer im Fichtelgebirge. '71, .10; Paramorphosen von Kalkspath nach Aragonit. '72, .20
- 7 Schilling S. Das Mineralreich. Oryktognosie und Geognosie. 183pp. 522 il. 8. 1864, G. 2. .35
- 8 Schmeisser J. G. System of Mineralogy. 2 vol. 721pp. pl. 43 beautifully col. fig. 4to. hcf. L. & G. 1753, 2. .350
- 9 Schmiedel D. C. C. Erz-Stoffen u. Berg Arten. 72pp. 30 pl. 43 beautifully col. fig. 4to. hcf. L. & G. 1753, 2. .350
- 70330 Schneider E. H. Chemische Constitution des Wolframminerals. 18pp. 8. unb. 1850, G. 1. .20
- 1 Schoedler & Medlock. Elements of Mineralogy and Geology. 99pp. 128 il. 1. .25
- 2 Schoenbein. Atzozonhaltiger Woelsendorfer Flussspath. 3pp. 8. unb. 1852, G. 1. .40
- 3 Schuster. Crystallogr. Study of Danburite. 8. unb. '86, 1. .20
- 4 Scott R. H. Min. Localities of Donegal. 8. unb. '63, 1. .20
- 5 Seybert. Analyses of Am. Minerals. P. Ac. J. '21. .25
- 6 Sharswood W. Cat. of Minerals containing Cerium. Cat. of Mineral Species Allanite. 8. p. 1862, 1. .20
- 7 Shepard C. U. Treatise on Mineralogy. 2 Parts (3 vol.) bound in 1. 1010pp. 654 il. 1832 & 185, 2, 2.00; or Part 2, (2 vol.) alone. 735pp. 500 il. helioth. '35, 2, .75; or same with nus. notes by Dr. A. Fitch, 1.00; or 2d ed. 2 Parts (3 vol.) in 1. 881pp. 623 il. 1835 & '44, 1. .200
- 8 "Address before Agl. Soc. of Hampshire, Franklin & Hampden Cos. 1847. 32pp. 8. p. 1825, 1. .25
- 9 "Papers, A. A. S. Dysyntribite, Houghite, Calypsoite, etc. 10 il. '51, 1.1; Chalcodite, Triplite etc. il. 52, .15
- 70310 "E. M. Systematic Min. Record, 98pp. 84 to '84, 3.0
- 1 Silliman B. Notice of the Mineralogical Collection in the Crystal Palace. 17pp. 8. unb. 1854, 1. .35
- 2 Smith E. F. Pectolite, Titanite etc. 8. stitched. '84, 1. .10
- 3 "J. L. Researches in Mineralogy. 401pp. il. 8. '73, 1. .400
- 4 "Geol. of Emery & Corundum. A. A. S. '62. .10
- 5 "Minerals and Mineral Waters of Chili. 23pp. 4to. unb. 1855, 1. .25
- 6 "L. Lecture on Mineralogy. 36pp. 8. p. 1834, 1. .35
- 7 "F. S. Pocket Geologist & Book of Minerals. 128pp. et. '77, 1. .50
- 8 Smith & Thomas. Corundum & Wavellite. A. P. '81, .10
- 9 Smechting. Kuenstlicher Greenockit. 8. unb. '53, G. 1. .20
- 70350 Solly. Cornwall & Devon Minerals. 8. unb. '86, 1. .30
- 1 Sowerby J. British Mineralogy. Vol. 1 to 4. 838pp. 400 pl. 1193 beautifully col. fig. 8. p. orig. ed. 1804 to 1809, 2, lacks 8pp. of text and 5 pl. .15.00
- 2 "Popular Mineralogy. 352pp. 20 col. pl. 80 fig. '50, 2, 3.00
- 3 Spallanzani. Voyage dans les Deux Sicilies et Appennins. 6 vol. in 3. 1686pp. 7 pl. 8. cf. P. 1800, 1. many pp. devoted to Mineralogy and Volcanic Products. .35.00
- 4 Stephens W. Notes on Mineralogy of Parts of the Vicinity of Dublin. 57pp. map, 8. bds. 1812, 2. .75
- 5 Stewart D. Report on Mineralogy to the Dublin Soc. 142pp. 8. stitched. 1800, 1. .1.00
- 6 Stokes W. Cat. of Minerals in Museum of Trinity College Dublin (1089 specimens described). 147pp. 8. st. 1807, 1. .1.50
- 7 Story-Maskelyne & Flight. Isopyre, Percylite, Vanadinite, Uranite etc. il. 8. p. 1872, 1. .20
- 8 Suckow G. Mineralische Verwitterung. 8. unb. '53, 1. .15
- 9 Sullivan W. K. New Hydrated Silicate of Potash; and Reniform Structure in Minerals. 8. unb. '62, 1. .15
- 70360 Swallow E. H. Analysis of Samarskite. B. '75, .20
- 1 Tennant & Mitchell. Crystallography and Mineralogy. 285pp. 394 il. stitched. 1860, 1. .50
- 2 Tenney. Quartzite of Williamstown. Mass. A. A. S. '74, .20
- 3 Theophrastus. Hist. of Stones with an English Ver-
- sion & Notes by Hill. 393pp. 8. cf. 1774, 3, rare. .500
- 4 Thomson T. Outlines of Mineralogy, Geol. & Mineral Analysis. 2 vol. 1308pp. il. hmo. '36, 2, 6.00; or bds. 5.00
- 5 "Chem. Examination of Minerals, chiefly from Am. with Notes by J. Torrey. 78pp. N. Y. L. '28. .75
- 6 "System of Chemistry, with Notes by Cooper. 4 vol. 1938pp. 8. cf. 1818, 2, .50; or Vol. 3 alone, complete as to Mineralogy. 451pp. 8. cf. 1818, 3. .25
- 7 "R. D. Papers, 8. unb. 1. Analysis of Wollastonite. '33, .15; Chem. Analysis of Indian Mesolite. '34, .20
- 8 Tourmaline, Pyro-Electricity of. 8. unb. '19, 1. .10
- 9 Townson R. Philosophy of Mineralogy. 234pp. 2 pl. (1 col.) 31 fig. 8. bds. 1798, fine uncat. copy. .2.00
- 70370 "Travels in Hungary 1793. 524pp. col. map, 16 pl. on Mineralogy & Nat. Hist. 4to. cf. 1797, 2, rare. .4.00
- 1 Traill. Min. of Halkin Mt. 17pp. 8. unb. '21, 1. .15
- 2 Traphagen F. W. Index to the Literature of Colum-bium 1801 to 1887. 27pp. 8. p. 1888, new. .15
- 3 Trimmer J. Pract. Geology and Mineralogy. Analysis of Minerals. 527pp. pl. 212 il. 8. 1842, 2. .50
- 4 Troil. U. v. Letters on Iceland, with Bergmann's Chem. Ex. of Lava & other Products. 114pp. 4to. unb. 10, 1. 1.00
- 5 Troost G. Papers, P. Ac. J. Some new Crystalline Forms of U. S. Minerals. 5 il. '21, .35; Same, of Pyroxene. 20pp. pl. 10 fig. '23, .25; Same, of Yenite from R. I. A. P. Trans. '25. .20
- 6 Turner E. Papers, 8. unb. 1. Radiated Celestine from Hanover. '24, .15; Analysis of Cornwall Mica. '25, .15; Analysis of Euchroite. '25, .15; Varicite. '30, .15; Chem. Examination of Wad. '30. .15
- 7 Ulloa A. de. Noticias Americanas. Producciones en las Tres Especies. Mineral. Vegetal y Animal etc. 356pp. 8. cf. Madrid, 1792, 1, very rare. .1.50
- 8 Ulrich F. Voltait vom Rammelsberge. 8. unb. '53, 1. .20
- 9 Vanuxem. Anal. of Zirconite from N. C. P. Ac. J. '23, .20
- 70380 Vanuxem & Keating. Obs. on some of the Minerals discovered at Franklin, N. J. P. Ac. J. '24. .20
- 1 Varley D. Rudimentary Treatise on Mineralogy. 170pp. 2 pl. (1 col.) 30 fig. 63 il. 1849, 1. .50
- 2 Vauquelin C. Papers, 8. unb. 1. Analysis of Mellite. 1800, .10; Analysis of Gadolinite. 1800, .15; Experiments on Cerite. 1805. .15
- 3 Vernon. Anal. of Aluminous Mineral. 8. unb. '29, 1. .15
- 4 Verrill. Zircon and Corundum from Me. B. '62. .10
- 5 Wackenroder. Diopside of Fassa, Tyrol. 8. unb. '28, 1. .20
- 6 Wadsworth M. Papers, B. So called Tremolite of Newbury, Mass. '77, .15; Danalite from the Iron Mine, Bartlett, N. H. '79, .15; Picrolite from Fla. '79. .15
- 7 Walker. Mineralogical Journeys etc. 8. unb. '22, 1. .10
- 8 Wallerius J. G. Systema Mineralogicum. 2 vols. 1207pp. port. 2 pl. 40 fig. 8. cf. 1778, L. 4. .2.50
- 9 "Same in French. 2 vol. 1158pp. 4 pl. 8. cf. 1753, 2, .250
- 70390 Warder. Silicified Stumps of Col. (Abst.) A. A. S. '83, 1.0
- 1 Warrington. Native Sulph. of Bismuth. 8. unb. '31, 1. .15
- 2 Watson W. Strata of Derbyshire and the Fossils found in them. 87pp. 2 pl. *1to. bds. Sheffield 1811, 2, perhaps the earliest work on English Mineralogy. .3.50
- 3 Weiße F. C. Beitrage zur topographischen Mineralogie Norwegens. 80pp. 3 maps. 8. unb. '43, G. 1. .50
- 4 Weiss. Distribution of Manganese. A. A. S. '52. .10
- 5 Werner A. J. Treatise on the External Characters of Fossils. 323pp. 2 pl. 55 fig. 8. bds. Dublin 1805, 2. .2.00
- 6 Wetherill C. M. Chem. Exam. of Two Minerals from Reading & Occurrence of Gold in Pa. A. P. Trans. '53, 15
- 7 Wheatley. Cabinets at Union College. 8. stitched. 1. .25
- 8 Whewell W. Report on Mineralogy. 44pp. 8. unb. '33, 1. .50
- 9 Whitman & Keene. Notes on Mineralogy. 140pp. '72, 1. .75
- 70400 Whittlesey. Penokite Mineral Range, Wis. B. '62, .15
- 1 Williams J. Natural Hist. of the Mineral Kingdom. 2 vol. 1067pp. 8. bds. Edinburgh 1759, uncat. 2. .1.00
- 2 Williams H. W. Travels in Italy, Greece and the Ionian Isl. 2 vol. 800pp. 9 pl. 8. bds. 1820, 2, contains Mineralogical Report on Elba etc. .1.50
- 3 Wright A. W. Gases in Smoky Quartz. 8. unb. '81, 1. .15
- 4 Wollaston W. H. Papers, 8. unb. '13, 1. Platina & Palladium, Brazil. .15; Identity of Columbite & Tantalum. .15
- 5 Bigsby J. J. Topography & Geol. of Lake Ontario (Minerals etc.) 49pp. map, 8. unb. 1828, 1. .50
- 6 Bournon Count de. Arseniates of Copper and Iron. 13pp. 2 pl. 50 fig. 8. unb. 1801, 1. .25
- 7 Chevenix R. Analysis of the Arseniates of Copper and Iron. 31pp. 8. unb. 1801, 1. .25
- 8 Heddle Prof. County Geognosy and Mineralogy of Scotland. 81pp. col. map, il. 8. unb. '78 and '79, 1. .75
- 9 "Pilotite, an unrecognized species. 8. unb. '79, 1. .20
- 70500 Hayden F. V. Geol. & Nat. Hist. of the Upper Missouri. 218pp. col. map, 10 il. A. P. Trans. '62, 1, 1.50; or Narrative, Geol. & Min. alone. 137pp. .1.00
- 1 Hunt T. S. Dr. Genth's Researches on Corundum and its Associated Minerals. B. 1874. .20

MINING AND MINING LOCALITIES.

See also special heads for Official Geol. Surveys; Mineralogy in General; Coal; Iron; Gold and Silver; Copper; Zinc, Lead and Tin; Geology; Am. Local Mineralogy, etc.

- 70140 Aldama D. J. de. Informe sobre la Minería de Malaga en 1848. 27 pp. 2 tables, 4to. unb. '57, 1. .30
- 1 Allen Slate Co. Vt. Report on Quarry by C.S. Richardson. 66pp. map, 8 sect. 8. p. 1857, 2. .30
- 2 Am. Salt & Lumber Co., Mich. 23pp. col. map, 8 p. '65, 1.15
- 3 Anales del Ministerio de Fomento de la Republica Mexicana. Vols. each about 500pp. col. pl. maps, il. 8. p. 1, much on Mining, Geol. etc. each. 1.00
- 4 Andre G. G. Mining Machinery, Tools and other Appliances used in Mining. 2 vol. 182 pl. with descriptive Letter Press. 4to. 1878, new. 22.50
- 5 " Rock Blasting. 202pp. 12 pl. 56 il. 8. '78, 1. 2.00
- 6 Arts & Sciences of the World, see No. 70060, 2.00
- 7 Atkins J. Pract. Miner's Own Book and Guide. Art of Assaying etc. 172pp. 2 pl. 24 il. 1860, 1. 1.00
- 8 Atkinson. Friction of Air in Mines. 69pp. bds. '75, 1. .35
- 9 Austrian Mines, Products etc. 8. unb. 1851, 1. .15
- 70420 Bailes W. Student's Guide to Principles of Coal and Metal Mining. Vol. 1 (all pub.). 253pp. 62 pl. 296 fig. 8. humor. 1879, 1, rare. 8.50
- 1 Bainbridge W. Practical Treatise on the Law of Mines and Minerals. 632pp. 8. humor. 1841, 1. 1.50
- 2 Balch. Mines, Miners and Mining Interests of the U. S. in 1882. 1200pp. il. 4to. new. 8.00
- 3 Ballantyne R. M. Deep Down: A Tale of the Cornish Mines. 426pp. 6 pl. 1874, 4. .35; or new. .75
- 4 Balzberg C. Kleine Ventilations Anlage am Franz Josefs Stollen zu Hallstatt. pl. 6 fig. 8. unb. '79, G. 1. .20
- 5 Barus C. Electrical Activity of Ore Bodies. 61pp. 13 il. A. I. M. 1884, 1. .35
- 6 Basset J. Obs. on Cornish Mines. 20pp. 8. p. 1842, 1. .20
- 7 Bayles J. C. Papers, A. I. M. The Engineer and the Wage Earner. '89, 10; Professional Ethics. '86. .10
- 8 Beer A. H. Lehrbuch der Markscheidkunst fuer Bergschulen etc. 38pp. 237 il. 8. p. G. 1866, 2. .50
- 9 Bell. Min. Resources, Hudson's Bay Terr. A. I. M. '86, 10
- 70430 Berghes H. de. Umtriebsmaschinen etc. beim Berg u. Httw. Mexico's bis 1825. 70pp. 2 pl. 8. unb. '47, 1. .60
- 1 Birkinbine J. Resources of Lake Superior Region. 3pp. map, A. I. M. 1887, .20
- 2 Bischof G. Origin of Quartz and Metalliferous Veins. 29pp. 8. unb. 1845, 1. .30
- 3 Blackwell J. K. Ventilation of Mines. 8. unb. '54, 1. .20
- 4 Blake W. P. Mining & Storing Ice. 10 il. A. I. M. '83, .10
- 5 " Mineral Resources of Rocky Mt. Chain. B. '59. .15
- 6 Blandy J. F. Mining Regions around Prescott, Arizona. large map, A. I. M. 1883, .20
- 7 Bonnard A. H. de. Mines. 93pp. 8. stitched, F. n. 1.1. .35
- 8 Bowman A. Mining Developments on the N. W. Pacific Coast & their Wider Bearing. A. I. M. '87, .15
- 9 Bowron W. M. Geol. and Mineral Resources of Sequachee Valley, Tenn. large map, A. I. M. '85, .15
- 70440 Boyd C. R. Resources of South-West Virginia. 335pp. col. map, 11 pl. il. 8. 1881, 1. 2.50
- 1 " Papers, A. I. M. Mineral Resources of S. W. Va. '80, .10; Economic Geol. of the Bristol and Big Stone Gap Sect. of Tenn. and Va. '86. .25
- 2 Brard. Elements d'Exploitation. 274pp. hel. 37, F. 2. .15
- 3 Brainerd A. T. Papers, A. I. M. Colored Mining Labor. '85, 10; Fire-Sand in Clinton Co. N. Y. '86. .10
- 4 Brown. Nitre Cave in Kentucky. A. P. Trans. 1894, 1. .20
- 5 Brunswick Antimony Co. Report by Chase & Petherick. Analysis by A. Hayes. 17pp. 8. p. 1864, 1. .35
- 6 Buck & Goessmann. Petit Anse Rock Salt Deposit. 35pp. 2 maps. 4to. p. 1. .25
- 7 Budje J. Pract. Miner's Guide, or Treatise on Mining Engineering. 199pp. 31 il. 8. 1858, 1. 1.00
- 8 " Plans & Sections of Mines. 8. unb. '55, 1. .15
- 9 Burat A. Theorie des Gites Metalliferes appuyee sur la description des principaux Types du Harz etc. and Gites Metalliferes de l'Algerie etc. in 1 vol. 537pp. 11 pl. 14 il. 8. humor. F. 1845, 1. 2.50
- 70450 " Geol. Appliquee, ou Traite de la Recherche et de l'Exploitation des Mineraux Utiles. 630pp. 30 pl. col. map, 235 il. 8. p. F. '46, 1. 1.25; or Same with Supplement 2 vol. 744pp. col. map, 35 pl. 8. humor. '46 & '53, F. 1. 5.00
- 1 Campbell J. L. Mineral Resources etc. of Country adjacent to James River & Kanawha Canal. 22pp. 8. st. 79, 1. .20
- 2 " & Ruffner. Physical Survey of Ga. Ala. & Miss. along Ga. Pacific R. R. 147pp. 3 col. maps. 8 p. '83, 1. Minerals etc. .35
- 3 Campin. Mech. Engineering. Metallurgy etc. Iron & Iron Ores. 29pl. 1020 il. 8. new, last ed. 5.00
- 4 Castro M. F. de. Electricity & Metamorphism of Rocks & Formation of Metalliferous Deposits. 8. unb. '80, 1. .25
- 5 Chapman E. Table for Calculating Weight & Yield per running Fathom of Mineral Veins. 8. unb. 70, 1. .15
- 6 Cheshire Salt and Salt Making. 29pp. 8. p. 1873, 1. .20
- 7 Chili Mines & Mining Operations. 8. unb. '54, 1. .15
- 8 Chism. New Mining Code of Mex. 20pp. A. I. M. '85, .20
- 9 Christy. Miners' Fund, New Almaden. A. I. M. '84, .10
- 70460 Church J. A. Mining Schools in U. S. 24pp. 8 p. '71, 1. .20
- 1 Clever. New Mexico, Resources (Mines etc.). 47pp. 8. p. '58, 1. .25
- 2 Collins J. H. Metal Mining. 149pp. 77 il. '74, new. .30
- 3 " Mining and Quarrying. 118pp. 34 il. '72, 2. .35
- 4 Colorado. Mineral Development of. 8. unb. '65, 1. .15
- 5 Comstock T. B. Papers, A. I. M. '86. Min. Engineering at the Ill. University. .10; Geol. and Vein Structure of S. W. Colorado. 48pp. 4 pl. .35
- 6 Conflagration in Idria Quicksilver Mine. 8. unb. '27, 1. .15
- 7 Construction of the Mining Statutes of the U. S. of 1866 and 1872. 18pp. 8. stitched, 1877, 1. .25
- 8 Copp. Am. Mining Code. 153pp. 8. p. '80, new. .40
- 9 Cordier M. L. Examination of Experiments in Subterranean Temperature etc. 29pp. 8. unb. '28, 1. .30
- 70470 Cornwall, its Mines and Miners. 315pp. il. 1. 1.00
- 1 Cotta. Formation of Metalliferous Veins. 8. unb. '54, 1. .25
- 2 Curtis W. M. Animikie Rocks and their Vein Phenomena as shown at Duncan Mine. pl. A. I. M. '87, .15
- 3 Cox E. B. Papers, 8. p. 1. Boards of Arbitration. 25pp. '71, 10; Min. Engineering as a Profession. 16pp. '78, .35
- 4 Credner H. Practical Study of Mining Engineering etc. in Clausthal. 8. p. 1867, 1. .20
- 5 Currie G. E. Early Discovery of the Mineral Wealth of the U. S. etc. 8. 1864, 1. .20
- 6 Daddow & Bannan. Coal, Iron and Oil. Our Mines & Mineral Resources. 808pp. map, 224 il. & sect. 8. '66, 1. 5.00
- 7 Dagget E. Improved System of Cornish Pitwork. 21pp. 8 pl. 17 fig. A. I. M. 1879, .20
- 8 Dahlgren. Historic Mines of Mex. pl. 4to. new. 8.00
- 9 Daily Graphic. Extra Mining No. Oct. 1879. il. 1. .15
- 70480 D'Aligny H. F. O. Report on Mining and Mechanical Preparation of Ores. 104pp. 3 pl. 37 il. 8. p. '70, 1. .25
- 1 Daub. Bergbau des Muenstherthals bei Freiberg im Breisgau. 80pp. pl. 17 fig. 8. unb. '46, G. 1. .60
- 2 Davies D. C. Metalliferous Minerals and Mining. 452pp. 145 il. last ed. new. 4.00
- 3 " Earthy and other Minerals and Mining. 335pp. 75 il. last ed. new. 4.00
- 4 Davy J. Temperature of Mines etc. 8. unb. '25, 1. .10
- 5 Dawson G. M. Mines and Minerals of Economic Value of Brit. Columbia, with Localities. 47pp. 8. p. '71, 1. .25
- 6 Day. New Almaden Quicksilver Mine. 8. unb. '58, 1. .15
- 7 Dechen H. v. Papers, 8. unb. G. 1. St. Etienne Bergschule. '43, 15; Vorkommen der Quecksilbererze im Pfälzisch-Saarbruecken Kohlen Geb. 90pp. '48. .50
- 8 " & Wedding. Official Cat. of Mining etc. in the Zoll Verein Exhibition, Phila. 1876. 106pp. 8. p. '72, 2. .35
- 9 De la Beche et al. Records of the School of Mines. London 1852. 156pp. 8. 1. 1.00
- 70490 Delius. L'Exploitation des Mines. 2 vol. 997pp. 25 large pl. 4to. cf. Paris 1788, F. 2, rare. 5.00
- 1 D'Heiny D. Quicksilver in Cal. 8. unb. 1874, 1. .10
- 2 Dieck. Foerder u. Wasserhaltungs Dampfmaschinen in England u. Schottl. 76pp. pl. 8. unb. '47, 1. .50
- 3 Dietrich Baron de. Gites de Mineral des Forges et des Salines des Pyrenees. 623pp. 6 pl. (some col.) 4to. hef. F. Paris 1786, 1, rare. 6.50
- 4 Difficulty between Chili and Peru. 78pp. 8. p. '79, 1, much on Nitre and other Minerals. .25
- 5 Drinker. Explosive Compounds, Machine Rock Drills and Blasting. 4to. il. 1883, new. 4.00
- 6 Du Faur. Sulphur Deposits of S. Utah. A. I. M. '87, .10
- 7 Dufrenoy M. Gypse et Minerals Metalliferes du Sud-Ouest de la France. 47pp. pl. stitched. '27, F. 1. .50
- 8 Dupont E. Jurisprudence des Mines, Minieres, Forges et Carrieres. 2 vol. 1374pp. 8. hef. F. '53, new, rare, 4.00
- 9 Education among Miners. 8. unb. 1858, 1. .15
- 70500 Eggleston T. Papers, 8. p. 1. Technical Education. 14pp. 76. 15; Improvement of Condition of Workmen. '76. 10; Mercury in N. Cal. 37pp. pl. '76, 35; Genesis of Certain Ore Deposits. 22pp. '86. 20; Thoughts and Suggestions on Technical Education. 39pp. '88. .10
- 1 Eissler. Modern High Explosives. Nitro-Glycerine & Dynamite, their Manufacture, Use and Application to Mining etc. il. 8. 2d ed. 1886, new. 3.20
- 2 Ellery, J. G. Property of Catawba Mining Co., McDowell Co., N. C. 8. unb. 1854, 1. .15
- 3 Ellis. California Borax Deposit. 8. unb. '77, 1. .15
- 4 Emmons S. F. Papers, A. I. M. Mining Work of U. S. Geol. Surv. '82, .15; Structural Relations of Ore Deposits. 36pp. '88. .15
- 5 " E. Mining & Geol. 253pp. hrn. 1826, 4, rare. 1.00
- 6 " E. Some Min. Resources of N. Y. 45pp. 8. unb. '46, 1. .25
- 7 English & Foreign Mining Glossary & Smelting Terms of France, Spain & Germany. 133pp. p. '48, 1. .50
- 8 Faber & Alibert. Russian Graphite Mines. 34pp. port. 6 pl. 8. p. 1865, 1. .50
- 9 Farey. Blasting with Gunpowder. 8. unb. 1805, 1. .10

- 70510 Fenwick T. Subterranean Surveying & the Variations of the Magnetic Needle. 224pp. 8. bds. '22, 3. .75
- 1 Ferber J. J. Gebirge u. Bergwerke in Ungarn u. Steirischen Eisenschmelzen. 346pp. 4 pl. 8. hcf. 1780, 3. 1.00
- 2 Firmstone F. Tamping Drill-Holes with Plaster of Paris. A. I. M. 1884. .15
- 3 Fordyce W. Hist. of Coal, Coke, Coal Fields, Iron, its Ores and Processes of Manufacture etc. 172pp. col. map. 32 pl. folio. hcf. London 1860, 2. .250
- 4 Foster J. W. Mineral Wealth and Railroad Development. 60pp. map. 8. p. 1872, 1. .25
- 5 " Mineral Resources of Ill. Central R.R. 8. p. '56, 1. .60
- 6 Fox R. W. Papers. 8. unb. 1. Remarks on Mineral Veins. '20, '15; Increase of Heat in Mines. '31, '15; Mineral Veins. 61pp. 3 col. pl. '36, 1.00; Electricity of Metallic Veins. il. '58, '20; Temperature of United Mines, Cornwall. '47. .15
- 7 " Electro-magnetic Properties of Metalliferous Veins in Cornwall. 16pp. 27 il. 4to. unb. 1830, 1. .35
- 8 Foster & Whitney. Report on Geol. & Topogr. of Lake Superior Land Dist. Part 1. Copper Lands. 224pp. 4 maps. 12 pl. 8. '50, 1. '50; or 3. '35; Part 2. Iron Region & Gen. Geol. 422pp. 37 pl. 8. '71, 1. '50; Part 3. 3 large fldg. maps. 8. 1.00; or the 3 vols. .550
- 9 France. Notices on Models, Charts and Drawings relating to Mines etc. 416pp. 8. p. 1876, 1. .50
- 70520 " Notices sur les Collections etc. relative au service du Corps Imperial des Mines. 346pp. 8. 1867, 1. .50
- 1 Francis W. High Temperature of the Water at the United Mines, Cornwall. 8. unb. 1847, 1. .20
- 2 Frazier P. Papers. A. I. M. Improved Mining Lamp. il. '10; Certain Silver and Iron Mines in the States of Nuevo Leon & Coahuila, Mex. 37pp. map. 7 pl. '84. .35
- 3 Freeland F. T. Sulphide Deposit of South Iron Hill, Leadville, Col. 2 pl. 9 il. A. I. M. '85. .15
- 4 Freiesleben. Sporadische Gangformate. 8. unb. '45, 1. .15
- 5 Gaertner. Mining Compass etc. il. A. I. M. '86. .10
- 6 Gesner A. Industrial Resources of Nova Scotia. Phys. Geogr., Geol., Mines etc. 336pp. pl. 8. 1849, 1. .250
- 7 Graphite Mine in Glen Farrer. 22pp. 8. unb. '30, 1. .20
- 8 Gresle. Dictionary of Mining Terms. 8. new, last ed. 175
- 9 Gilpin E. Mines and Mineral Lands of Nova Scotia. 140 pp. 8. '830, new. .50
- 70530 Griffith Sir H. Fossil and Mining Localities in Ireland. 134pp. 8. unb. 1861, 1. .100
- 1 Grimm. Lagerstätten der Nutzbaren Mineralien. 25 pp. 75 il. 8. p. 1869, G. 2. .150
- 2 Hague & King. Mining Industry. 659pp. 38 pl. 4to. 1, and folio Atlas of 14 col. sheets. 1870, 1. .2000
- 3 Hainault. Belgium, Min. Operations. 8. unb. '54, 1. .10
- 4 Hale P. M. In the Coal and Iron Counties of North Carolina. 425pp. col. map. '83, 1. .75
- 5 " A. W. Analysis of Statistics. A. I. M. 1881. .10
- 6 Hall & Dickens. Map of Treasure Hill, White Pine Co. Nevada (only very small ed. printed), new. .4000
- 7 Hamilton P. Resources of Arizona. Mineral Lands etc. 474pp. map. 19 pl. 3d ed. 1884, 1. .100
- 8 Hammond. Cauca Min. Dist., Colombia. A. I. M. '84, 1. .10
- 9 Harris J. S. Beneficial Fund of the Lehigh Coal and Navigation Co. 21pp. A. I. M. 1884. .15
- 70540 Hartmann C. Handbuch der Bergbaukunst. 2 vol. Text. 804pp. 4to. 1, and folio Atlas 73 pl. hmo. '44, 1. 5.00
- 1 " Berg und Huettenmaennischer Atlas. 42 pl. over 200 fig. folio. hcf. 1860, 1. .200
- 2 Hatton & Harvey. Newfoundland. 448pp. map. 8 pl. 20 il. '83, 1, much on Mineral Resources. .150
- 3 Hauer J. R. v. Ventilationsmaschinen der Bergwerke. 88pp. 7 pl. 87 fig. 8. p. G. 1870, 2. .50
- 4 Haupt T. Geognostische u. Bergmaennische Bemerkungen ueber St. Domingo. 138pp. 8. unb. '43, 1. .60
- 5 Heinrich O. J. Papers. A. I. M. Manhattan Salt Mine, Goderich. Can. 20pp. 5 il. '78. '15; Industrial School for Miners and Mechanics, Drifton, Pa. '81. .10
- 6 Helmlacker R. Geol. Verhaeltnisse Japan's u. seine nutzbaren Mineralien. 22pp. pl. 8. unb. G. '79, 1. .25
- 7 Henderson J. T. Commonwealth of Ga. 387pp. 15 col. maps (1 min. map) pl. il. 8. '85, 1, 47pp. on Minerals, 1.00
- 8 Henfrey. Proposals for Mining. 20pp. 8. p. 1797, 1. .30
- 9 Henrich C. Notes on Geol. and some of the Mines of Aspen Mt., Pitkin Co., Col. 50pp. 9 il. A. I. M. '88. .30
- 70550 Henwood G. Geol. & Mining. 94pp. map. 8. '55, 1. 1.00
- 1 " Papers. 8. unb. 1. Geol. Surv. of Cornwall Mines. '31, '20; Electric Currents in some Metalliferous Veins. '37, '20; Mining Experience and Results. '55. .10
- 2 Herrick C. L. Minnesota Laws relating to Mines and Mining. 23pp. 8. unb. 1884, 1. .25
- 3 Hewitt A. Century of Mining and Metallurgy in the United States. 33pp. 8. p. 1876, 1. .15
- 4 Hilgard E. W. Geol. of Lower La. & Salt Deposits on Petite Anse Isl. 34pp. 2 maps. 4 il. 4to. p. 1872, 1. .100
- 5 Hiortdahl T. Om Underberget ved Kongsberg, og om Guldets Forekomst sammesteds. Text. pl. 8. p. '68, 1. .20
- 6 Hitchcock E. Report on Re-Examination of the Econo- nomical Geol. of Mass. 139pp. 8. p. 1838, 1. .30
- 7 Hittel. Mining in the Pacific States. 224pp. 1862, 1. .30
- 8 " Resources of Cal. Agl. Mining etc. 527pp. '69, 1. .20
- 9 Hodges A. D. Topogr. & Geol. of the Cerro de Pasco Peru (Mining Belt etc.). 24pp. 4 il. A. I. M. '88. .20
- 70560 Hodgson Chem. of the Mine. 111pp. 4 pl. '81, new. .40
- 1 Hollister. Mines of Colorado. 457pp. col. map. '67, 1. .80
- 2 Hooker. Mining in Oaxaca, Mex. A. I. M. '86. .30
- 3 Hopton W. Conversation on Mines etc. Lecture on Explosive Gases etc. 267pp. pl. il. 1875, 1. .50
- 4 Hrdina. Das Steinsalz u. die Steinsalzgewinnung zu Wieliczka. 24pp. 8. unb. 1842, 1. .20
- 5 Humboldt A. de. Papers. 8. unb. 1. Temperature of Different Am. Mines. '40, '15; Discovery of a Platinum Mine in Colombia and in the Ural Mts. '26. .20
- 6 Hunt R. British Mining. History, Discovery, Prac. Development and Future Prospects of Metalliferous Mines in the United Kingdom. il. 8. '84, new. .2000
- 7 " Mineral Statistics of Great Britain and Ireland. 1869. 246pp. 8. p. 1870, 2. .20
- 8 " Mining, Metallurgy etc. 17pp. pl. il. 8. unb. '64, 1. .20
- 9 " T. S. Coal and Iron in Ala. A. I. M. 1883. .10
- 70570 International Exhibition 1876. Reports & Awards Group 1. contains Minerals, Mining and Metallurgy by G. C. Broadhead etc. 493pp. il. 8. p. 1878, 1. .150
- 1 Irving. Min. Resources of Wis. 30pp. col. map. 8. p. '80, 1. .30
- 2 Jackson's Map of the Mining Districts of Cal. Appendix to 16pp. col. map 18 x 22 inch. 1851, 3. .50
- 3 Jackson C. T. Report on Geol. & Mineral Surv. of the Mineral Lands in Mich., together with Foster & Whitney. Report on Explorations in the Lake Superior Land Dist. & Geol. Report of W. A. Burt & Hubbard on Survey of Township Lines. 562pp. 11 maps and sections. 7 pl. 8. hrm. 1849, 3. .150
- 4 " Zinc, Lead & Copper Ores of N. H. 8. unb. '43, 1. .10
- 5 James T. P. Handbook of Georgia. 263pp. 8. 1876, 1. 1.00
- 6 Japanese Mines. 8. unb. 1876, 1. .20
- 7 Keatinge W. H. Art of Mining. 87pp. 8. p. 1821, 1. rare 1.00
- 8 Kedzie G. E. Bedded Ore Deposits of Red Mt. Mining Dist. Ouray Co. 5 il. A. I. M. 1888. .10
- 9 Keeler's Map of U. S. Terr., Pacific R. R. Mineral Lands and Indian Reservation. 48 x 60 inches, col. on muslin in hmo. cover. 1867, 1. .250
- 70580 Keith N. S. Electrical Apparatus & Processes for the Mining & Metallurgical Engineer. A. I. M. 1882, 1. .30
- 1 Kempton. New Min. Dist. Sullivan, Me. il. A. I. M. '79, 1. .10
- 2 Killebrew J. B. Ocoee and Hiwassee Mining District of Tennessee. 6pp. 4 col. maps. 8. p. 1876, 1. .00
- 3 " Tennessee: its Agl. & Mineral Wealth, with App. showing Extent, Value etc. of its Ores with Analyses of the same. 196pp. 2 col. maps. 8. p. 1876, 1. .100
- 4 " & Safford. Introduction to Resources of Tenn. 1210pp. col. geol. & 3 other maps. 8. '74, 1, much on Minerals, 1.00
- 5 Kimball J. P. Our Mining Interests. 42pp. 8. p. 1. .25
- 6 Kinahan. Valleys and their Relations to Fissures, Fractures and Faults. 1875, new, last ed. .300
- 7 King C. U. S. Mining Laws. State & Territorial Min. Laws & Local Mining Rules etc. 711pp. 4to. '85, 1. 1.25
- 8 Kitchell W. Mines of New Jersey. 8. unb. 1855, 1. .20
- 9 Klipstein. Dolomite der Lahngegend u. Vorkommen von Manganerzen. 40pp. col. pl. 8. unb. '43, 1. .35
- 70590 Kohl J. G. Bessarabische Steppe u. Kochsalzgewinnung an deren Kuesten. 23pp. 8. unb. '42, 1. .10
- 1 Kropff F. C. Report on the Lewis Mine. Union Co., N. C. 11pp. large ground plan, il. 8. st. '49, 1. .25
- 2 Krug v. Nidda. Ventilator Angewendet beim Gegenorts Betriebe. 20pp. pl. 7 fig. 8. unb. '45, G. 1. .25
- 3 Lawton. Mines & Mining Interests of Mich. unb. '56, 1. .20
- 4 Leeds. Rudisel Gold & Copper Mine. N. C. 8. unb. '54, 1. .10
- 5 Lieber Metalliferous Veins of South. il. 8. unb. '55, 1. .15
- 6 Lintern W. Mineral Surveyor's Guide, new, last ed. 270
- 7 Litton A. Principal Mines of Franklin, Washington, St. Francis & Madison Cos. Mo. 94pp. 8. unb. '55, 1. .20
- 8 Loehneys G. E. v. Bericht von Bergwerken. 362pp. 16 fldg. pl. folio. hcf. 1690, G. 2, rare and valuable work and remarkable fine condition. .500
- 9 Lucas. Mines and Mining Statistics of N. S. Wales. 252pp. 7 maps (2 col.) 5 pl. 13 sect. 8. 1875, 1. .100
- 70600 McCoy. Mines & Mining in Col. 42pp. 8. st. '71, 1. .20
- 1 McCracken S. B. Hist., Resources etc. of Mich. 186pp. map. 5 pl. 8. p. '76, 1, much on Min. .25
- 2 M'Creath. South. Cokes & Iron Ores. 20pp. A. I. M. '87, 1. .10
- 3 McDowell F. H. American Mining Machinery in Mexico and Central Am. 4 il. A. I. M. '84. .35
- 4 Macdonald A. Death in the Mine. Explosions in mines. Appendix by E. Lever. 41pp. 8. p. 1885, 1. .100
- 5 Machlachlan. Mines etc. of E. Indies. 8. unb. 1806, 1. .15
- 6 Mackworth H. Science in the Mines. 8. unb. '55, 1. .35

(Mining, 70610.) MINERALS, SCIENTIFIC AND MEDICAL BOOKS, Etc.

- acfarlane T. Economic Minerals of Lake Superior, Rocks & Cupriferous Beds etc. 50pp. 8. unb. '66, 1, .40
- ahon. Duties of Mineral Agents. 48pp. 8. unb. '62, 1, .35
- alheiro L. Cat. of Portuguese Exhibit of Mining & Metallurgy at Phila. Exhibition 1876. 113pp. 8. p. 1, .25
- o Mansfield. Electric Motor in Mining. A. I. M. '88, 10
- ap of Strontianite Mines, Ark. 30 x 32 inches, 1, .25
- ap of E. Tenn. & W. N. C. showing Mineral Deposits near Knoxville. 16 x 24 inches, 1876, 1, .35
- ap of Property of U. S. Antimony Co. Ark., .10
- ap of the Mining Distr. of Lake Superior, Mich., by Booth & Hulbert. 60 x 54 inches, col. in cover, '55, 1, 3.00
- laury & Fontaine. Resources of W. Va. 430pp. 8. '76, 1, .75
- lexico. Informes y Documentos relativos a Comercio, Agricultura, Minería etc. '86. 256pp. 8. p. 1, .25
- lexico. Mines of. 8. unb. 1825, 1, .20
- Michell. Mine Drainage. 277pp. il. 8. new, .48
- Michigan. Gen. Mining Laws etc. 23pp. il. 8. p. '65, 1, .15
- 20 Mich. Geol. Survey. 4 vol. about 1650pp. il. 4to, 1, and 30 Atlas of 13 col. sheets of Mines etc. Full information on Copper and Iron Ores etc., 15.00
- Mich. Com. of Mineral Statistics Repts. 1879 to '83. 1 vol. 523pp. 75 maps and sect. 8. hcf. & p. 1, .35
- Miller M. Temperature of Mines. 8. unb. 1823, 1, .10
- Hills J. E. New Method of Shaft-Sinking through Water-bearing loose Materials. 19pp. pl. 16 il. A. I. M. '84, .15
- Mineral Veins in Primary Clay States. 8. unb. '58, 1, .15
- Mines and Mining. 192pp. 8. pl. hru. 4, .25
- Mining in Wall Street. 17pp. 8. unb. '55, 1, .20
- Mining Almanack, compiled by H. English, for 1849. 850 and 1851. 3 vol. 1432pp. 2, .125
- Mining Discoveries—Divining Rod. 8. unb. '58, 1, .15
- Johns F. Geognostical Phenomena in Preliminary Mining Operations. 51pp. 8. unb. 1840, 1, .50
- Morgans W. Manual of Min. Tools. Vol. Text. 214pp. 4to. Atlas, 20 pl. 238 fig. 71, 1, 1.25; or Atlas alone, .75
- Morrison R. S. Mining Rights in Colorado. 331pp. sh. 70, 2, .35; or 6th ed. 347pp. 1888, new, 1.50
- Mining Reports, each about 750pp. 8. sh. new, 5.00
- Moses. Electric Lighting of Mines. A. I. M. '81, .10
- Mowry S. Mines in the West. 8. unb. 1864, 1, .15
- Proposed Territory of Arizona. 30pp. map, 8. p. '57, 1, .75
- Mullan J. Miners' and Travelers' Guide to Oregon, Idaho etc. 153pp. col. map of mining regions, '62, 1, .50
- Munroe. Min. Wealth of Japan. 67pp. map, 8. p. '78, 1, .25
- Summer School of Practical Mining. A. I. M. '81, 10
- Murchison. Verneuil & Kayserling. Geology of Russia in Europe and the Ural Mts. 2 vol. 1232pp. 2 col. maps, 74 pl. (24 col.) 1122 fig. 90 il. 4to. '45, 1, much on Min., 15.00
- 40 Nevada. Biennial Reports of the State Mineralogist, each about 220pp. 8. p. 1, .75
- Newberry J. S. Deposition of Ores. 17pp. 8. p. 1884, 1, .35
- New Idria Mining Co. Memorial in the Matter of the Panoche Grande Rancho. 16pp. 8. p. 1867, 1, .25
- New South Wales Mines and Mineral Statistics. 252pp. 2 col. maps, 25 pl. & sect. 35 il. 8. heloth. '75, 1, .35
- Mineral Products of. Description of Metals by Liver- side etc. 343pp. 5 col. maps & charts, 4to. p. '82, 1, 1.25
- Mineral Map & Gen. Statistics. col. map, 8. p. '76, 1, .10
- Reports of Deptmt. of Mines. 4to. p. 1. 1875. 170pp. 2 pl. 28 fig., '83. 218pp. col. map, 32 pl. & sect., .75
- Nicaragua and its Mines. 8. unb. 1856, 1, .15
- Nichols. Aluminium Ore. A. I. M. 1887, .10
- Noeggerath. Bergwerksschulen in Frankreich u. Belgien. 106pp. 8. unb. 1842, G. 1, .60
- 60 North Carolina. Guide to Capitalists & Emigrants. 136pp. col. map. 8. 1869, 1, much on Minerals, .75
- Nova Scotia. Reports of the Department of Mines, each about 90pp. 8. p. 1, each, .75 to 1.00
- Oeynhausen. Anfertigung u. Effect der Hohlisen Bohrgestänge. 26pp. 2 pl. 7 fig. 8. unb. '47, G. 1, .25
- Onondaga Salt Springs. Annual Reports of the Supt. each about 48pp. pl. 8. p. 1, .25 to 1.00
- Oregon. Mineral Resources etc. 47pp. map, 8. p. '80, 1, .15
- Orton J. Underground Treasures: How and Where to find them. 145pp. 5 pl. col. il. 1887, new, 1.25
- Owen D. D. Report on Mineral Lands of the U. S. 161pp. 27 maps, pl. and sect. (some col.) 8. hcf. 1840, 2, 1.50
- R. E. & Cox. Mines of New Mex. 59pp. 8. p. '65, 1, .50
- Palissy B. Oeuvres Completes. (Métaux et Alchimie, des Pierres etc.) 47pp. p. 1814, F. 1, 1.25
- Paris Dr. (?) Guide to Mount's Bay and Land's End. Mining etc. of West Cornwall, 291pp. il. '28, 2, 2.00
- 650 Pazos V. Letters on United Provinces of S. Am. to H. Clay. 259pp. map, 8. et. '19, 1, much on Minerals, .75
- Pearce R. Association of Minerals in the Gagnon Vein, Butte City, Montana. A. I. M. 1887, .15
- Pemberton J. D. Vancouver Isl. & Brit. Columbia. 18pp. 4 col. maps, 8. '60, 2, Minerals, Rocks etc., 1.50
- Peschier. Wielitska, Poland, Salt Mines. 8. unb. '01, 1, .10
- Pierce. Self-Dumping Water Tank. il. A. I. M. '85, .10
- Philada. & Reading R. R. Cat. of Specimens of Min. Products etc. from Line of. 44pp. 8. p. '76, 1, .20
- Phillips. Explorers' & Assayers' Companion. Vol. 1. Rocks, Veins, Testing & Assaying. 8. '77, new, 4.80
- 7 " Ore Deposits. il. 8. 1884, new, 6.00
- 8 " J. Ventilation of Mines etc. 69pp. 8. unb. 1854, 1, .40
- 9 " Syst. of Mining Coal & Metals. 87pp. 3 pl. '58, 1, .50
- 70670 " W. On the Divining Rod. 8. unb. 1802, 1, .20
- 1 " J. A. & Darlington. Records of Mining and Metallurgy. 311pp. 2 pl. 18 il. 1857, 2, .60; or, p. 2, .30
- 2 Pocket Mining Atlas. 4to. cf. new, last ed., .90
- 3 Pomeroy H. R. Mining Manual. 127pp. '81, new, .75
- 4 " R. A. Petite Anse Salt Mine. il. A. I. M. '88, .10
- 5 Pontoppidan E. Nat. Hist. of Norway. 515pp. 30 pl. 150 fig. folio, sh. 1750, 2, Minerals, Mines etc., 5.00
- 6 Porter J. B. Iron Ores and Coals of Ala., Ga., and Tenn. 49pp. map, A. I. M. 1886, .25
- 7 Pryce W. Minerals, Mines and Mining. 378pp. 3 pl. folio, bds. 1778, 2, .50
- 8 Pumpelly R. Report on Iron Ores and Coal Fields of Mo. Vol. Text. 671pp. pl. sect. 190 il. 8. '73, 1, and folio Atlas of 14 sheets, unb. 1, 3.00; or, Text alone, 1.00
- 9 " Mining Industries of the U. S. (exclusive of Precious Metals). 1033pp. 102 maps, sect. and pl. (mostly col.) 242 il. 4to. 1886, new, 2.25
- 70680 Quicksilver Mining Co. Report etc. Notes on New Almaden Mines by Silliman. 118pp. map, 8. p. '65, 1, .35
- 1 " Annual Reports, each about 60pp. 8. p. 1, .25
- 2 Ramirez S. Noticia Hist. de la Riqueza Minera de Mexico. 772pp. 8. p. 1884, Spanish, 1, 1.00
- 3 Rand A. C. New Rock Drill. il. A. I. M. '84, .10
- 4 Raymond R. W. Papers, A. I. M. Hygiene of Mines. 24pp. '79, .15; New Method of Dredging applicable to Min. 3 il. '79, .10; Divining Rod. 35pp. '83, .15; Lives Process of Engraving & its Usefulness to Engineers. '86, .15; Discussion of Recent Decisions of the Supreme Court under the U. S. Mining Law. 34pp. il. '86, .20; The New York Mining Law. '88, .10
- 5 " Reports on U. S. Mining Industries. see U. States.
- 6 Records of the School of Mines. Vol. 1, Pt. 2. 200pp. 2 pl. (1 col.) il. 8. '53, 1, Articles by Jukes et al., .75
- 7 Ribeiro C. Minas Metallicas de Portugal. 3 Parts. 82pp. 2 pl. 4to. unb. 1861, 1, Portuguese, .75
- 8 Richards R. H. Papers, A. I. M. New Hydraulic Separator. il. '83, 10; Am. Mining Schools. 32pp. '86, .15
- 9 Richardson C. S. Papers. 8. unb. '54, 1. Cobalt & Nickel Mines, Chatham, Conn. .15; Vt. Slate Quarries, .15
- 70690 Rickard W. Miner's Manual of Arithmetic & Surveying. 220pp. 4 pl. (1 col.) 83 il. 8. 1859, 2, 1.00
- 1 " F. I. Mining Journey across the Andes, Mining District of San Juan etc. 339pp. 2 maps, '63, 1, 1.50
- 2 Roberts. Wire Rope Haulage and its Application to Mining. 45 il. A. I. M. 1887, .20
- 3 Rolker C. M. Papers. A. I. M. Fire Bulkhead. '84, .10; Notes on Leadville Ore Deposits. 20pp. 8 il. '85, .15
- 4 Rothwell R. F. Papers, A. I. M. New Method of Laying Submarine Tunnels & Tubes. il. '86, .10; Systems of Mining in Large Bodies of Soft Ore. 4 il. '88, .10
- 5 Sandberger. Metal Vein Formation. 18pp. 8. unb. '77, 1, .15
- 6 Schlutter C. A. De la Fonte, des Mines, des Fonderies, etc. 2 vol. 1135pp. 60 pl. 4to. cf. F. 1750, 3, 2.50
- 7 Schmitz E. J. Geol. and Min. Resources of Rio Grande Region in Tex. & Coahuila. 17pp. map, il. A. I. M. '85, 20
- 8 Scoresby W. Permeability of all Known Substances to the Magnetic Influence and Application of the Fact in Mining etc. 52pp. 2 pl. 8 fig. 8. unb. 1832, 1, .50
- 9 Shinn. Advance in Mining since '75. A. I. M. '81, .20
- 70700 Silliman B. Mineral Regions of South New Mexico. 20pp. A. I. M. 1882, .15
- 1 Simms S. W. Practical Tunneling, revised by Clark. 354pp. 21 pl. 106 il. 8. 1877, new, last ed., 6.75
- 2 Simonin. Cobalt & Nickel Mine. Chatham. 8. unb. '54, 1, .10
- 3 Silversmith J. Pract. Handbook for Miners, Metallurgists & Assayers. 294pp. 9 pl. 100 il. '67, 1, 1.00
- 4 Skinner. Mining Directory of the Am. Mining Agency. Mines, Mills, Surveyors etc. 176pp. 8. p. '78, 1, .50
- 5 Small. Min. Resources of Canada. 72pp. p. '82, 1, .25
- 6 Smart S. F. Leadville, Ten Mile, Eagle River & other Colorado Mining Camps. 56pp. 2 maps, il. 8. p. '70, 1, .20
- 7 Smith J. L. History and Statistics of Canadian Salt Trade and Manufacture. 54pp. 8. unb. '76, 1, .25
- 8 Smith R. A. Metal Mining. pl. 8. unb. '65, 1, .30
- 9 " F. H. Rocks, Minerals & Stocks. 241pp. '82, new, .50
- 70710 Smith W. W. Mines of Wicklow and Wexford. 64pp. col. map, pl. 17 fig. 8. p. 1853, 1, .50
- 1 " Papers, 8. unb. 1. Gogofau Mine, Caermarthenshire. il. '46, .20; Saxony & Hungary Min. Academies. '46, .20; Mining Dist. of Cardiganshire & Montgomeryshire. 30pp. 5 pl. il. '48, .50
- 2 Sopwith. Mining District of Alston Moor etc. 191pp. col. map, 8. 1833, 3, 1.00
- 3 South W. Mo. Min. Wealth of. 64pp. col. map, 3, '74, 3, .50
- 4 Spitsbury. New Air Compressor. 4 il. A. I. M. '79, .10

- 5 Stafford H. N. Slate Tables for the Use of Slaters. Quarries etc. 84pp. 5 pl. (some col.) '64, 1, .50
- 6 Steinbeck. Rechtsverhältnisse der Zuthungen nach preussischen Berggesetzen. 48pp. 8. unbk. '47. G. 1. 30
- 7 Steinsalz in den Niedersaechsisch-Thueringschen Provinzen, Aufsuchung etc. 34pp. 8. unbk. G. '42, 1, .30
- 8 Stevens, Lake Superior Min. Prospects. 8. unbk. '54, 1, .15
- 9 Stewart W. A. Mineral Resources of the Pacific States and Territories. 32pp. 8. p. 1855, 3, .50
- 70720 Strombeck. Schoeningen Salz. 36pp. 8. unbk. '48, 1, .25
- 1 Stuart J. M. Mining, Theory & Practice. new, last ed., .90
- 2 Stubbs. Analyses of Ala. Ores & Coal. 8. unbk. '76, 1, .10
- 3 Sutor. Lect. on Mines & Mining. 11. unbk. '74, 1, .15
- 4 Tail. Resources of Ala. Minerals etc. 24pp. 8. p. 71, 1, .50
- 5 Tapping T. Rhymed Chronicle of Edward Wanlove. 40pp. 8. p. 1851, 1. valuable Glossary of Derbyshire Mining Terms, rare, .150
- 6 " Derbyshire Mining Customs etc. 178pp. 1, rare, 1.25
- 7 Taylor I. The Mine. 26pp. 16 pl. 45 il. '45, 1, .60
- 8 " Mines of Different Countries. 280pp. 13 il. 2, .50
- 9 " J. Papers, 8. unbk. 1. Hist. of Mining in Devon & Cornwall. 1799, 20; Blasting Rocks and Tamping. 1808, 20; Improvements in Mining. '29, 20; Report on State of Knowledge respecting Mineral Veins. 25pp. '34, .30
- 70730 " P. Horizontal Pumping Engine erected in the Mine of Moran, Mex. pl. 8. unbk. '27, 1, .25
- 1 " R. C. Two Models & Sections of Part of the Mineral Basin of So. Wales. Text, col. map, 4to. p. '30, 1, .25
- 2 " T. J. College of Pract. Mining. 8. unbk. '57, 1, .15
- 3 Tennessee. Report of the Bureau of Agri. Statistics & Mining, 1876. 445pp. 8. maps, il. 8, '77, 2, 1.00
- 4 Thomassy R. Salt, Historically, Statistically etc. New Am. Manufacture. 8. unbk. 1857, 1, .20
- 5 Thompson M. Indiana Chalk Beds. 8. unbk. '86, 1, .10
- 6 Trigger. Betrieb von Schachten etc. unter Wasser mit Hülfe verdichteter Luft. 22pp. pl. 8. unbk. '42, 1, .25
- 7 Tudor H. Tour in N. Am. comprising Mex., U.S., and Brit. Colonies. 2 vol. 1945pp. 34, 2, much on Min., 2.00
- 8 Unger U. v. Steinsalz Erbohrung bei Schoeningen, Braunschweig. 66pp. col. map, pl. 8. unbk. '59, 1, .35
- 9 U. S. Antimony Co. Prospectus. 2 maps, 8. p. '88, .10
- 70740 U. S. Mining Laws & Regulations. 41pp. 8. p. '81, 1, .20
- 1 U. S. Mineral Resources. Reports on. 8. 1. Brown & Taylor. 1st Report. 340pp. '67, 15, 2d. 745pp. '68, 20; Raymond. 1st Report. 256pp. map, 21 il. '69, 40; 2d. 80pp. 4 pl. '76 il. '70, 40; 3d. 566pp. 5 pl. il. '72, 1, 00; 4th. 565pp. 9 pl. 27 il. '73, 40; 5th. 550pp. col. geol. map of U. S. by Hitchcock & Blake, 2 maps, 32 pl. 23 il. '73, 3, 00; or without map, 1, 00; 6th. 555pp. 11 pl. 30 il. '74, 2, 00; 7th. 540pp. 20 pl. & maps, 9 il. '75, 75; 8th. 529pp. 8 pl. 56 il. '76, 1, 00; or the 10 Reports of Brown & Taylor & Raymond, complete, 10, 00; Williams. 1st Report. 830pp. '83, 40; 2d. 1040pp. '85, 50; Day. 683pp. 1886, .50
- 2 Vt. State Bd. of Agri. Report 1872, contains Rept. of State Geologist; Chromic Iron of Vt. by E. P. Colton and Mining in Vt. by H. A. Cutting. 8. 1, 1.00
- 3 Vezin H. A. Notes from a Journey in South Russia. 48pp. 4 maps & pl. showing Iron Deposits etc. 8. unbk. '81, 1, .25
- 4 Vennor H. G. Some of the Economic Minerals of Ontario, Can. 61pp. col. map, il. 8. unbk. '76, 1, .50
- 5 Victoria. Mineral Statistics of. 53pp. folio, st. '79, 1, .50
- 6 Vollwinkel. Entschädigung fuer Wasserentziehungen durch den Bergbau. 25pp. 8. unbk. '51, 1, .25
- 7 Waite C. E. Papers, A. I. M. Antimony Deposits of Ark. '79, 10; New Laboratory of Mo. School of Mines. il. '86, 10
- 8 Wall & Sawkins. Progress 1856 to '57 of Survey of Economic Geology of Trinidad. Sm. '57, .10
- 9 Wapler. Gasfeuerungs Anlagen auf der Saline zu Schoenebeck. large pl. 4 fig. 8. unbk. '51, G. 1, .20
- 70750 Watt J. Ventilation of Mines. 8. unbk. 1816, 1, .15
- 1 Weiss O. Ursprung der Soolquellen u. die Saline Sooden, Allendorf, Hessen. 67pp. col. pl. 8. unbk. '51, 1, .40
- 2 White C. A. Gypsum Deposits of Iowa. 14pp. map, pl. il. 8. unbk. 1870, 1, .50
- 3 Whitney. Metallic Wealth of U. S. 510pp. 44 il. 8. '54, 1, 1.00
- 4 " Colorado Ores. 61pp. 2 maps, 4to. p. 1867, 1, .50
- 5 " Same in French. 71pp. 2 maps, 4to. p. '67, 1, .50
- 6 " Changes in Mineral Veins. 8. unbk. '55, 1, .15
- 7 Whittlessey C. Mineral Resources of the Cordilleras of North America. 64pp. map, p. 1863, 1, .25
- 8 " Origin of Mineral Veins. A. A. S. 1877, .10
- 9 Williams S. G. Applied Geology. 387pp. '86, new, 1.20
- 70760 " C. Treasures of the Earth. 324pp. pl. 1834, 1, 1.00
- 1 " A. Reports on Mining Industries, see No. 70741,
- 2 Willmot. Some Mines of Quebec. 8. unbk. '83, 1, .35
- 3 Wilson & Robb. Metals in Canada. 80pp. 8. st. '61, 1, .25
- 4 Winchell. Salt Well, Humboldt, Minn. A. A. S. '85, .10
- 5 Wordsworth C. Law of Mining. 815pp. 8. '64, 4, 1.50
- 6 Worthen A. H. Economical Geology of Ill. 3 vol. 1783pp. 8. 1882, 1, .600
- 7 " Min. Resources of Ill. 16pp. 8. stitched, 1, .20
- 8 Zobel. Graphit in Schlesien etc. 29pp. 8. unbk. '50
- 9 Agricola. De Re Metallica Libri XII. 812pp. 274 il. vellum, 1657, L. 1,
- 70770 Cook & Smock. Clay Deposits of Woodbridge Amboy etc. N. J. 389pp. col. map, sect. 8. p. 78, 1,
- 3 Colton H. E. Report on Coal Mines and other Min. of Tenn. 128pp. map, il. 8. p. 1883, 1,
- 2 Curtis J. S. Abstract of Report on the Mining Geol. Eureka Distr. Nevada. 27pp. 2 col. sect. 8. unbk. '81
- 3 Hall C. E. Field Notes in Delaware Co. Pa. (on Quarries, Kaolin Mines etc.) Analyses of Rocks Minerals by Genth. 144pp. col. map, 35 photos, 8. p. 29, pl. of mines etc. 8. '65, 1, .50; or 2,
- 5 Lesley Sanders, D'Inville, et al. Geol. of Leth. Northampton Cos., and of the South Mt. Belt of Co. Pa. (Slate Quarries, Iron Ores etc.) 2 vol. Text, 79 pl. 72 il. & Atlas of 29 sheets (some col.) 8. p. 85, new,
- 6 Mexico. New Mining Code of. 71pp. p. '85, new,
- 7 Orton E. et al. Economic Geol. of Ohio, 114pp. and maps, 78 il. 8. '84, 1, (Coal, Iron, etc.),
- 8 Osborn. Minerals, Mines & Mining. 11. 8. '88, new

Journals, Proceedings of Societies, etc.

(Where only one number is ordered not less than is charged.)

- 70780 Am. Jour. of Mining, ed. by G. F. Dawson. W. 4to. 1. Vols. (26 Nos.) each, 1.50; Nos. each, 1.00
- 1 Am. Mining Engineers Trans. Vol. 1 to 10, 1875 to 8. p. & humor. 1, 45.00; Vols. p. & humor., 3.00
- 2 Am. Mining Gazette & Geol. Magazine. N. Y. M. each about 590pp. pl. il. 8. 1, 1.00; Nos. 8. p. 1,
- 3 Am. Mining Index. W. N. Y. 4to. 1. Nos. each,
- 4 Annales des Mines. Paris. Livraisons. 8. p. 1, about 275pp. pl. il.,
- 5 Archiv fuer Mineralogie, Bergbau etc. (Karlsruhe). Vols. each about 650pp. pls. 8. bef. 2,
- 6 Berg u. Huetttenmaennisches Jahrbuch. Wien. A. Vols. (4 Hefte) each about 400pp. pl., 1.50; Hefte,
- 7 Bulletin de la Soc. Min. de France. Nos. 8. p. 1,
- 8 Canadian Mining Rev. M. Ottawa. Vols. 50; Nos.
- 9 Chicago Mining Jour. M. 4to. Vols. 59; Nos.
- 70790 Coal & Iron Record. W. N. Y. 4to. Nos. each,
- 1 Coal Trade Jour. W. N. Y. 4to. Nos. each,
- 2 Engineering & Min. Jour. W. N. Y. 4to. stitched Vols. (26 Nos.) each, 1.50; Nos. each,
- 3 Jern-Kontorets Annaler. Stockholm, 1827 to (lacking 1836, '38, '39, '42 & '43.) together 23 Vols. in pls. 8. hrm. 1, Swedish, the lot,
- 4 Journal des Mines. Paris. 45 odd Nos. between 1 & 1804, bound in 13 vol. 8. bds. 1, 6.00; Vols. 8. Nos.
- 5 Maine Mining Jour. W. Bangor. 4to. st. Nos.
- 6 Mineralogical Magazine & Jour. of Min. Soc. of Britain & Ireland. Nos. 8. p. 1,
- 7 Mining Herald & Colliery Engineer. W. Phila. Nos.
- 8 Mining Jour. Railway & Commercial Gazette. London, folio, 1. Nos. each,
- 9 Mining Magazine, ed. by Tenney et al. M. N. Y. Vols. (6 months) 1.25; or Nos. p.
- 70800 Mining Record. W. N. Y. 4to. stitched. Nos.
- 1 Mining Review. W. Chicago, 4to. stitched, 1. Vols (Nos.) each, 1.25; Nos.
- 2 North of England Institute of Mining Engineers Trans. Vols. each about 225pp. pls. & il. 8. hef. 1,
- 3 Pacific Coast Annual Mining Review. each about 20 8. p. 1,
- 4 Proceed. of Min. & Geol. Sect. of Ac. of Nat. Sci. of Philada. 8. p. 1. '77 to '79, 96pp. il., 15, '80 to 35pp. il.,
- 5 Protector (The) Semi-monthly Mag. devoted to C. Iron etc. Harrisburg. Nos. 8. p. 1, each,
- 6 Real Estate & Mining Rev. M. Ottawa. 4to. Nos.
- 7 Revue Universelle des Mines, de la Metallurgie Nos., each about 225pp. pls. 8. p. 1,
- 8 " Same, English Edition. Nos. 8. p. 1,
- 9 Rivista Mineralogia e Cristallografia Italiana. Fa. culi. each about 16pp. 8. p. 1,
- 70810 Russische Mineralogische Gesellschaft, Verh. d. J.ungen. each about 80pp. pls. 8. p. 1,
- 1 School of Mines Quarterly. Columbia College, S. Nos. each about 95pp. pls. il. 8. p. 1,
- 2 Slate Trade Journal. M. Easton. 4to. Vols. 1.00; Nos.
- 3 Sociedad Mexicana de Minera. Resena de los Tabla Vols. each about 165pp. 8. stitched, 1,
- 4 Virginias (The). Mining, Industrial and Science Jour. M. Staunton. 4to. 1. Nos.,
- 5 Zeitschrift fuer Kristallographie u. Mineralog. Hefte, each about 100pp. pls. 8. p. 1, 1.00; Vols.

PRICE LIST OF SPECIES AND THE LEADING VARIETIES OF CABINET SPECIMENS.

It must be borne in mind that these prices are only average and are constantly changing. Of course as the list of species is as nearly complete as possible, could make it, there are many that have never been listed. The number preceding the name indicates the species, and the number following, the page in Dana's system of Mineralogy on which the name is found. Ap. for Appendix to Dana. Sm. for Smithsonian Annual Reports; thus, Sm. '85 means report for 1885. A. J. S. is the American Journal of Sciences, and the vol. and page follow. In our "Table of Mineral Species" following. Price in dollars and cents; 20 cents equals one franc; 25 cents equals one mark or shilling; 40 cents equals one florin. It is a very difficult matter to fix a range of prices that shall give a general idea from month to month of what is on hand. Although our stock is the largest in the world, there are many things priced in the following list that I have at one or two specimens of at the present time, and a few which I have none, but a week from this time I might have a ton in. The lowest price usually indicates such a small and usually massive specimen as a student would wish for analysis, and the highest price usually indicates a finely crystallized specimen, such as would grace the cabinet of the amateur. There are many things, priced from 10 to 25 cents in the catalogue, that I can furnish small sized massive hand specimens about 1 inch square, for 5 cents each. Of many things, I have large museum specimens that come higher. As revised, this price list is the best check list ever published. By the aid of this list

and the "Table of Species," most species may be verified. To ASCERTAIN THE CHARACTERISTICS OF ANY SPECIES.—Look in the following list for the Species No., and by this the Species can be found in its order in the "Table of Species."

To DETERMINE ANY MINERAL.—Test the hardness with a file, or better, with the minerals in the scale of hardness. It will be found in one of the columns of the Table of Hardness. Then, determining the color, we look in the column of this color in the Table of Color, and find that there are only a few of the numbers of the previously ascertained hardness in this column; then, determining the crystalline form or Specific Gravity, we eliminate others, bringing it finally down to one or two, which we find in their order in the "Table of Species," and compare their qualities. Take Cuprite as an example. We easily find that its hardness is 3.5-4. It must be in the column headed 3.5 to 4, or 4 to 4.5. Its color is cochineal red. Its crystallization is 1, streak 77-71. Cuprite is the only one agreeing with these readily recognized characteristics. As another common mineral, take green fluor spar in cubes. Its hardness is 4, its color 4, its crystallization 1. Its cleavage is B, octohedral, 159 is the only mineral combining these qualities.

One will be assisted in forming an opinion as to the probable identity of the mineral under consideration by remembering that in each column of the numerical tables the most common minerals form the first-third of each class.

Abichite 570.....	503 Amblygonite 545.....	5c. to 1 50	269 Aplome 268.....	15c. to 1 50
Abriachanite Ap. 3-1.....	Amblystegite Ap. 1-1.....	75c. to 1 50	370 Apophyllite 415.....	10c. to 50 50
Acadialite 434.....	802 Ambrite 747.....	75c. to 1 50	415 B. Aquacryptite Ap. 1-2.....	5c. to 50
Acanthite 51.....	799 B. Ambrosine Ap. 1-1.....	10c. to 10 00	254 Aquamarine 245.....	10c. to 5 00
Achmatite 282.....	231 Amethyst 193.....	5c. to 1 50	724 Aragonite 694.....	5c. to 5 00
Achrenalite Ap. 3-1.....	411 Amianthus 465.....	5c. to 1 50	795 A. Aragonite Ap. 2-4.....	5c. to 1 50
Achroite 367.....	507 Ammolite 547.....	5c. to 1 50	284 A. Ardenite Ap. 2-4.....	5c. to 1 50
H. Achtagradite 478.....	673 Ammonia Alum 651.....	1 00	Arenigipite Ap. 3-9.....	5c. to 2 00
Acmite 224.....	86 Amolbite 72.....	5c. to 1 00	248 Arfvedsonite 243.....	5c. to 2 00
Actinolite 233.....	247 Amphibole 232.....	5c. to 5 00	715 Argentine 678.....	25c. to 1 00
Adamite 565.....	574 Amphthalite 587.....	1 00	40 Argentite 38.....	10c. to 15 00
Adelpholite 525.....	310 Amorpholite 338.....	5c. to 1 00	Argentobismutite A. J. S. 31-229	5c. to 25
Adularia 354.....	383 Analcite 432.....	10c. to 2 00	316 Argillite 359.....	5c. to 25
Edelforsite 237 A.....	194 Anatase 161.....	5c. to 6 00	Argyrodite A. J. S. 32-163.....	5c. to 25
Eggrite 223.....	404 C. Anauxite 458.....	25c. to 1 00	72 A. Arite Ap. 2-4.....	5c. to 10 00
Ehrinite Ap. 3-2.....	322 Andalusite 371.....	10c. to 2 00	198 Arkansite 164.....	5c. to 10 00
Eschynite 522.....	312 Andesite 344.....	25c. to 75	165 Arksutite 128.....	5c. to 4 00
Agalmatolite 480.....	Andrewsite Ap. 1-1.....	5c. to 1 00	10 Arquerite 14.....	1 00 to 5 00
Agaric Stone 680.....	524 Anglarite 556.....	5c. to 1 00	724 Arragonite 691.....	5c. to 5 00
Agate 194.....	633 Anglesite 622.....	25c. to 10 00	17 Arsenic 17.....	10c. to 3 50
Agatized Wood 195.....	632 Anhydrite 621.....	5c. to 1 00	19 Arsenical Antimony 18 10c. to	2 00
Aglaite Ap. 3-112.....	717 Ankerite 685.....	5c. to 5 50	71 A. Arsenical Cobalt Ap. 1-1.	1 00
Agnesite 793.....	511 Annabergite 500.....	25c. to 1 50	94 " Pyrites 78.....	10c. to 2 00
A. Agrolite Ap. 2-1.....	Annerödite Ap. 3-7.....	25c. to 1 00	35 " Silver 35.....	2 50 to 5 00
Aikinite 101.....	Anonite 308.....	25c. to 1 00	118 " Silver Ore 96.....	5c. to 10 00
Aikite Ap. 3-3.....	125 Annivite 103.....	5c. to 2 00	Arsenioleptite A. J. S. 35-416	5c. to 2 50
Alabandite 46.....	Anomalite P. Ac.....	10c. to 2 00	570 Arseniosiderite 584.....	5c. to 2 50
Alabaster 638.....	Anomite Ap. 3-77.....	25c. to 1 00	570 Arsenocrocoite 584.....	5c. to 2 50
Albite 214.....	310 Anorthite 387.....	25c. to 1 00	519 Arsenolite 183.....	5c. to 1 00
B. Albertite 753.....	246 Anthophyllite 231.....	5c. to 1 00	94 Arsenoprite 78.....	10c. to 2 00
Albin 417.....	247 " Hyd. 242.....	5c. to 5 00	33 A. Arsenotellurite Ap. 2-5.....	5c. to 2 00
Albite 348.....	831 Anthracite 754.....	5c. to 25	Arsenstibite Ap. 2-5.....	5c. to 1 00
Alexandrite 153.....	715 Anthraconite 677.....	10c. to 25	247 Asbeferrite 234.....	5c. to 1 00
Alexandrite 323.....	816 Anthracoxenite 746.....	75	247 Asbestos 234, 216.....	5c. to 1 50
Algodonite 37.....	360 Anthradierite 407.....	75	218 Asbolan, Asbolite 1812.....	5c. to 1 00
Alipite 401.....	411 Antigorite 465.....	25c. to 1 00	231 B. Asmanite Ap. 2-5.....	5c. to 1 00
Allogite 227.....	Antillite Ap. 1-1.....	10c. to 1 00	492 Asparagus-stone 530.....	5c. to 1 00
Alloklite Sm. '84.....	411 Antimonarsenickel Ap. 2-3	10c. to 2 00	426 Aspidolite 485.....	25c. to 1 00
Allanite 285.....	19 Antimonial Arsenic 18.....	10c. to 2 00	830 Asphalium 751.....	5c. to 50
Alaskite Ap. 3-3.....	119 " Copper Glance 96.....	10c. to 5 00	329 Aspidolite 3-3.....	5c. to 1 00
Allemontite 18.....	72 " Nickel 61.....	25c. to 1 50	288 Aspidolite Ap. 1-2.....	5c. to 1 00
E. Allochroite 263.....	117 " Red Silver 94.....	25c. to 10 00	315 Asteriated Feldspar.....	25c. to 1 00
Alloclasite 81.....	35 " Silver 35.....	5c. to 10 00	231 " Quartz 193.....	75c. to 5 00
Allophane 616.....	227 Antimonious Oxide 187.....	10c. to 1 00	179 " Sapphire 138.....	5c. to 10 00
Allopaladium 12.....	29 Antimonite 29.....	5c. to 50 00	238 Asteroite Ap. 1-2.....	5c. to 1 00
Allophane 419.....	18 Anthymon 18.....	5c. to 3 00	659 Astracanthite 643.....	5c. to 1 00
A. Allophite Ap. 2-2.....	29 " Glance 29.....	5c. to 50 00	222 Astrophyllite 308.....	25c. to 1 50
Alundite 512.....	29 " Gray 29.....	5c. to 50 00	153 Atacamite 121.....	15c. to 2 00
G. C. Almandite 267.....	112 " Plumose 90.....	25c. to 2 00	337 Ateclite 392.....	1 00 to 3 00
27 Alstonite 628.....	221 " Red 184.....	25c. to 2 00	299 Atheriastrite 323.....	5c. to 1 00
48 Altaite 41.....	221 " White 184.....	25c. to 2 00	752 A. Atlasite 716.....	5c. to 2 50
Alum, Native 654.....	228 " Oehre 188.....	10c. to 5 00	Atopite Ap. 3-10.....	5c. to 1 00
Alum-stone 658.....	831 Antrimolite 430.....	5c. to 1 00	561 Atacolite 580.....	5c. to 5 00
Alumian 631.....	686 Apatite 657.....	10c. to 1 00	272 E. Auerbachite 276.....	1 00
Aluminite 658.....	492 Apatite 530.....	5c. to 10 00	Auerite, A. J. S. 36-461.....	5c. to 5 00
Alumocalcite 199.....	715 Aphrite 678.....	25c. to 50	238 Augite 216.....	25c. to 1 50
Alumite 658.....	320 Aphrodite 365.....	25c. to 1 00	750 Aurichalcite 712.....	25c. to 1 00
Alunogen 649.....	403 Aphrodite 457.....	5c. to 1 00	75 Auriferous Pyrite 63.....	10c. to 1 50
Alvite 511.....	454 Aphrosiderite 502.....	25c. to 1 00	" Quartz 6.....	10c. to 5 00
9 Amalgam 13.....	627 Aphthalite 615.....	5c. to 1 00	27 Auripigmentum 27.....	5c. to 5 00
A. Amazonstone Ap. 3-0.....	125 B. Apthionite 104.....	5c. to 1 00	98 Aurotellurite 81.....	5c. to 5 00
Amber 740.....	679 Apjohnite 653.....	5c. to 1 00		

A. E. FOOTE'S CATALOGUE OF MINERALS.

185 Automolite 149.....5c. to 5 00	551 Blue Feldspar 572.....5c. to 2 50	Cappelenite Sm. '85.....5c. to 5 00
573 Autunite 586.....5c. to 1 50	524 " Iron Earth 556.....5c. to 2 50	66 Capillary Pyrites 56.....25c. to 1 00
231 Aventurin Quartz 193.....50c. to 2 00	159 " John 123.....5c. to 5 00	172 " Red Oxide Copper 183.....10c. to 50c.
316 " Feldspar 355.....10c. to 2 00	669 " Vitriol 648.....25c. to 1 00	343 Caporicianite 399.....5c. to 1 00
311 " Labradorite 341.....25c. to 2 00	24 Boart (Diamond) 21.....1 00 to 10 00	231 Capped Quartz 189.....5c. to 1 00
314 " Oligoclase 347.....25c. to 2 00	523 A. Bobierite 795.....5c. to 1 00	24 Carbonado 22.....5c. to 1 00
285 Axinite 297.....25c. to 3 00	279 A. Bodenite 289.....5c. to 50	269 Carbuncle 265.....25c. to 1 00
832 Azorite 761.....1 00	206 Bog Iron Ore 172.....5c. to 25	502 Carminite 545.....5c. to 1 00
551 Azurespar or stone 572.....5c. to 3 50	420 Bole 476.....25c. to 50	147 Carnallite 118.....10c. to 50c.
752 Azurite 715.....5c. to 10 00	135 Bolivianite 109.....5c. to 1 00	231 Carnelian 194.....10c. to 50c.
242 Babingtonite 227.....50c. to 1 50	630 Bolognian Stone 616.....25c. to 1 00	374 A. Carolathine 420.....50c. to 1 00
278 Bagrationite 285.....50c. to 1 00	257 Boltonite 255.....25c. to 1 00	373 Carpholite 419.....50c. to 1 00
238 Baikalite 215.....50c. to 1 00	805 A. Bombicite Ap. 2-8.....50c. to 1 50	692 Carphosiderite 661.....10c. to 50c.
820 Bakerinite 747.....25c. to 1 00	426 Bondorfite 485.....50c. to 1 00	715 Carrara Marble 689.....15c. to 50c.
75 Ballesterosite 63.....25c. to 1 00	597 Boracite 595.....25c. to 2 50	82 Carollite 69.....10c. to 50c.
411 Baltimoreite 467.....10c. to 1 00	599 Borax 597.....10c. to 2 00	Caryinite Ap. 3-20.....5c. to 1 00
323 Bamblite 373.....50c. to 1 00	144 A. Borsosite Ap. 2-8.....5c. to 50	192 Cassiterite 157.....5c. to 1 00
Barrenite Ap. 3-11.....1 50	575 Borickite 588.....10c. to 5 00	316 Cassinite 356.....25c. to 1 00
Barringtonite Ap. 1-3.....1 00	49 Bornite 44.....10c. to 5 00	330 Castellite 386.....75c. to 1 00
630 Barite 616.....5c. to 10 00	602 Boronacalcite 598.....25c. to 1 00	51 Castillite 46.....2 00 to 10 00
79 Barnhardtite 67.....1 00	680 Bosjemanite 654.....75	244 Castor 229.....2 00 to 10 00
552 Barrandite 574.....1 50	687 Botryogen 657.....25c. to 1 00	444 Catapleite 401.....10c. to 50c.
310 B. Barsowite 340.....75	327 Botryolite 389.....25c. to 1 00	423 Catapleite 483.....10c. to 50c.
687 A. Bartholomite Ap. 2-6.....1 00	122 Boulangerite 99.....25c. to 2 00	Catlinite 796.....10c. to 50c.
Barylite Ap. 3-12.....1 00	119 Bournonite 96.....10c. to 5 00	231 Cat's-eye Quartz 193.....25c. to 1 00
Barysil A. J. S. 35-417.....1 00	651 Boussingaultite 635.....5c. to 50	179 " Corundum.....1 00 to 10 00
630 Baryt 616.....5c. to 10 00	411 Bowenite 465.....25c. to 50	630 Cawk 616.....10c. to 50c.
739 Barytocalcite 701.....5c. to 3 00	Brackebuschite Sm. '82.....75c. to 1 50	410 Celadonite 463.....5c. to 1 00
311 Basalt 343.....5c. to 1 50	272 F. Bragite 276.....1 50	90 Cellular Pyrites 75.....15c. to 50c.
231 Basanite 195.....10c. to 1 00	785 Branchite 736.....50c. to 2 50	311 Celestite 619.....5c. to 1 00
412 Bastite 463.....15c. to 1 00	461 Brandisite 508.....15c. to 1 00	341 A. Centralessite 796.....10c. to 50c.
732 A. Bastnastite Ap. 1-2.....2 50	196 Braunite 163.....25c. to 1 25	140 Cerargyrite 114.....10c. to 50c.
801 Bathylvite 742.....1 00	Bravaisite Ap. 3-18.....1 00	151 Cerasine 120.....10c. to 50c.
258 Batrachite 236.....15c. to 1 50	715 Breccia Marble 679.....10c. to 1 00	367 Cerite 413.....10c. to 50c.
439 Bavallite 796.....1 00	269 Bredbergite 270.....50c. to 1 50	414 Cerolite 470.....10c. to 50c.
59 Baylonite 563.....1 00	238 Breislakite 216.....25c. to 1 00	729 Cerussite 700.....10c. to 50c.
334 Beamanite 441.....25c. to 2 50	72 Breithauptite 61.....50c. to 2 00	227 Cervantite 187.....25c. to 1 00
203 Beauxite 174.....5c. to 50	718 Breunnerite 686.....10c. to 50	183 Ceylanite 147.....25c. to 1 00
600 Bechillite 597.....50c. to 1 50	378 Brevicite 425.....50c. to 1 60	386 Chabazite 434.....5c. to 1 00
231 Be-koite 196.....10c. to 1 50	395 Brewsterite 445.....25c. to 2 00	669 Chalcantite 648.....25c. to 1 00
Begeerite Ap. 3-13.....1 00	833 Brewsterlinite 761.....5c. to 50	231 Chalcedony 194.....5c. to 1 00
Belenosite A. J. S. 35-417.....1 00	701 Brochantite 664.....50c. to 5 00	563 Chalchihuitl 293.....5c. to 1 00
Bementite A. J. S. 35-417.....5 00	Bröggerite Sm. '84.....10c. to 3 00	61 Chalcoite 52.....5c. to 1 00
788 Benzole 737.....10c. to 50	727 Bromite 698.....10c. to 3 00	407 Chalcoite 460.....5c. to 1 00
524 Beraunite 558.....10c. to 50	142 Bromyrite 116.....1 00 to 5 00	572 Chalcomielite Ap. 2-11.....5c. to 1 00
830 D. Berengelite 738.....50c. to 1 00	111 Brongniardite 90.....2 00	Chalcomenite Ap. 3-23.....5c. to 1 00
359 Bergholz 403.....25c. to 75	234 Bronzite 209.....5c. to 1 50	370 A. Chalcophyllite Ap. 2-11.....5c. to 1 00
378 Bergmannite 427.....25c. to 1 50	198 Brookite 164.....5c. to 10 00	Chalcophanite Ap. 3-23.....5c. to 1 00
420 Bergseltite 479.....10c. to 50	716 Brossite 682.....25c. to 1 00	548 Chalcopyllite 571.....5c. to 1 00
549 Berthierite 571.....25c. to 1 00	716 Brown Spar 682.....5c. to 50	78 Chalcopyrite 65.....5c. to 1 00
104 Berthierite 56.....25c. to 1 00	210 Brucite 175.....10c. to 10 00	68 A. Chalcopyrrhotite Ap. 2-11.....5c. to 1 00
Bertrandite Sm. '82.....2 50 to 10 00	823 Brücknerellite 748.....5c. to 1 00	568 Chalcosiderite 583.....10c. to 50c.
254 Biharite 245.....5c. to 10 00	518 Brushite 552.....5c. to 25	101 Chalcostibite 85.....10c. to 50c.
254 Beryl 245 precious.....50c. to 10 00	801 Bucaramangite 741.....5c. to 25	172 Chalcotrichite 133.....10c. to 50c.
Beryllonite A. J. S. 37-31.....1 00	323 Bucholzite 374.....5c. to 25	715 Chalk 679.....5c. to 1 00
50 Berzelianite 46.....5c. to 2 50	Buckingite A. J. S. 36-156.....1 00	721 Chalybite 688.....5c. to 1 00
501 Berzelite 544.....50c. to 2 50	278 Bucklandite 285.....50c. to 1 00	259 Chamosite 511.....10c. to 50c.
767 to 771 Beta Naphtha Group 720.....50c. to 2 00	231 Buhrstone 196.....10c. to 25	83 Chathamite 70.....5c. to 1 00
582 Beudanticite 583.....50c. to 2 00	174 Bunsenite 134.....50c. to 2 00	299 Chelmsfordite 320.....5c. to 1 50
276 Beustite 282.....50c. to 2 00	750 Buratite 712.....10c. to 1 50	567 Chenevixite 583.....5c. to 1 00
66 A. Beyrichite Ap. 1-3.....50c. to 3 50	241 Bustamite 225.....10c. to 1 50	231 Chert 195.....5c. to 1 00
667 Bieberite 647.....50c. to 1 00	Bustamentite Ag. 1, Ap. 2-9.....5c. to 1 00	316 A. Chesterite Ap. 3-20.....10c. to 50c.
424 Biharite 438.....25c. to 1 00	821 Butyrellite 747.....5c. to 1 00	732 Chessy Copper 715.....5c. to 1 00
586 Bindheimite 591.....25c. to 2 00	830 F. Byerite Ap. 2-9.....5c. to 1 00	322 Chiasolite 371.....5c. to 1 00
110 Binnite 90.....1 50	247 Byssolite 234.....5c. to 1 00	560 Childrenite 579.....10c. to 50c.
239 Biotite 301.....5c. to 1 50	310 C. Bytownite 340.....5c. to 1 50	322 Chileite 612.....1 00 to 5 00
222 Bismite 185.....25c. to 1 50	529 Cabrerieite 561.....1 50	36 Chilenite 36.....1 00 to 5 00
20 Bismuth 19.....25c. to 5 00	Cacoclasite, This Cat.....10c. to 2 50	166 Chiolite 128.....5c. to 1 00
336 " Blende 391.....25c. to 1 00	232 Cacholong 199.....10c. to 50	103 Chiviatite 86.....25c. to 1 00
222 " Oehre 185.....25c. to 2 50	569 Cacoenite 584.....10c. to 1 50	183 Chloralluminate Ap. 3-25.....5c. to 1 00
31 " Tellurite 30.....1 00	69 Cadmium Blende 59.....10c. to 5 00	452 Chlorite 501.....5c. to 1 00
Bismuthaurite 795.....10c. to 5 00	231 Cairngorm Stone 193.....5c. to 10 00	444 Chlorite-like Mineral 493.....5c. to 1 00
30 Bismuthiniferous 33.....10c. to 5 00	361 Calamine 407.....5c. to 5 00	458 Chloritoid 504.....5c. to 1 00
38 Bismuth Silver 36.....1 00 to 10 00	361 " Green 497.....25c. to 3 00	138 A. Chlorocalcite Ap. 3-25.....5c. to 1 00
753 Bismutite 716.....50c. to 2 00	247 Calamite 233.....50c. to 1 00	Chloromagnesite Ap. 3-25.....5c. to 1 00
716 Bitter Spar 682.....10c. to 1 00	98 A. Calaverite 795.....5c. to 2 00	408 Chloropal 461.....25c. to 1 00
830 Bitumen 751.....5c. to 50	115 Calcareous Spar 670.....5c. to 1 00	467 Chlorophane 510.....5c. to 1 00
782 Bitumen, Elastic 734.....5c. to 50	715 " Tufa 680.....5c. to 1 00	159 Chlorophane 123.....10c. to 50c.
831 Bituminous coal 754.....5c. to 1 00	557 Calcioferrite 578.....5c. to 5 00	409 Chlorophane 462.....10c. to 50c.
56 Black Jack 48.....5c. to 5 00	715 Calcite 670.....5c. to 5 00	287 Chlorophyllite 301.....45c. to 1 00
183 Black Spinel 147.....5c. to 5 00	Calciozincite Ap. 3-20.....10c. to 1 50	183 Chlorospinel 147.....5c. to 1 00
676 Blakeite 632.....25c. to 2 00	636 Caledonite 625.....1 50 to 5 00	Chlorothionite Ap. 3-25.....5c. to 1 00
586 Bleinierite 531.....25c. to 2 00	568 Callaitite 572.....5c. to 1 00	Chlorotile Ap. 3-26.....50c. to 1 00
289 Black Garnet 268.....5c. to 2 00	136 Callait, Callait 580.....5c. to 5 00	167 Chodroffite 128.....5c. to 1 00
25 Black Lead 24.....2 00	436 Calomel 111.....25c. to 2 50	532 Chondrasenite 562.....10c. to 50c.
56 Blende 48.....5c. to 5 00	238 Canaanite 220.....10c. to 50	319 Chondrodite 363.....10c. to 50c.
659 Blöditte 643.....25c. to 2 00	304 A. Cancrinite 329.....25c. to 1 00	446 Chondrite 494.....10c. to 50c.
Blomstrandite Ap. 3-16.....1 00	831 Cannel Coal 755.....10c. to 5 00	773 Christmatite 728.....5c. to 1 00
231 Blood Stone 194.....10c. to 1 50	782 Caoutchouc Mineral 734.....5c. to 50	

PRICE LIST OF SPECIES AND THE LEADING VARIETIES OF CABINET SPECIMENS.

Christianite 337, 438.....50c. to 1 50	302 Couzeranite 326.....50c. to 1 00	28 Dimorphite 28.....1 00 to 5 00
Chrome Ochre 510.....50c. to 1 00	100 Covellite 83.....25c. to 1 50	786 Dinite 73.....50c. to 1 00
Chromite Chrom. Iron 153.....5c. to 5 00	200 Crednerite 1-6.....1 00	233 Diopside 214.....1 c. to 2 50
Chrysoberyl 153.....25c. to 5 00	249 Crocidolite 242.....5c. to 2 00	345 Diopside 401.....50c. to 10 00
Chrysocolla 402.....10c. to 2 50	642 Crocoite 629.....25c. to 5 00	302 Dipyre 326.....15c. to 1 00
Chrysolite 255.....5c. to 1 00	456 Cronstedtite 503.....25c. to 5 00	35 Diserasite 35.....25c. to 5 00
Chrysolite Iron-manganese 259	43 Crookesite 40.....1 00	185 Disluite 149.....5c. to 5 00
Chrysoprase 194, 246.....25c. to 3 50	322 Cross Stone 371.....5c. to 2 50	461 Disterrite 508.....50c. to 1 00
Chrysotile 465.....10c. to 3 00	164 Cryolite 126.....5c. to 5 00	324 Disthene 375.....15c. to 1 00
Churchite 555.....5c. to 1 00	295 Cryophyllite 316.....50	776 Dodecatylene 729.....5c. to 5 00
Cinnabite 457.....25c. to 75	Cryptolite A. J. S. 35-417.....1 00	715 Dog-Tooth Spar 672.....5c. to 5 00
Cinnabar 53.....10c. to 5 00	491 Cryptolite 429.....1 00	634 B. Dolerophanite Ap. 2-17.....5c. to 5 00
" hepatic 55.....25c. to 50	834 Cryptolite 762.....25c. to 1 00	716 Dolomite 681.....5c. to 2 50
Cinnamon Stone 266.....5c. to 2 50	502 Crytomorphite 599.....25c. to 1 00	37 Domeykite 36.....25c. to 5 00
Circolite 579.....15c. to 1 50	Crysothalite A. J. S. 34-73.....2 50	826 Dopplerite 747, 749.....25c. to 1 00
Citrine.....15c. to 1 50	77 Cubanite 65.....10c. to 50	715 Doubly Refrac. Spar.....10c. to 10 00
A. Claudetite 796.....1 00 to 2 50	538 Cube ore 578.....15c. to 2 00	637 Dreelite 626.....50c. to 1 50
Clausthalite 42.....1 00 to 2 50	383 Cubizite 433.....25	723 Dry Bone 692.....10c. to 1 00
Clay 473.....5c. to 25	Cuivre, <i>Vide</i> Copper.....1 00	459 A. Dudleyite Ap. 2-17.....5c. to 2 50
" Iron Stone 141.....5c. to 50	Cusageite Ap. 2-30.....1 00	568 Dufrenoyite 583.....5c. to 2 50
Clayite 108.....5c. to 1 00	229 Cumengite 188.....1 25	113 Dufrenoyite 92.....50c. to 1 50
Cleavelite Ap. 3-27.....5c. to 1 50	241 Cumingtonite 225.....1 00	435 A. Dumasite 503.....5c. to 5 00
Cleavelandite 350.....5c. to 25	791 Cumole 737.....5c. to 5 00	Dumortierite Sm. '82.....5c. to 5 00
Clintonite A. J. S. 34-232.....5c. to 5 00	172 Cuprite 133.....5c. to 5 00	Duporthite Ap. 3-39.....5c. to 5 00
Clinoclase 497.....10c. to 2 50	Cuprocaltite Ap. 3-32.....2 00	503 A. Durangite Ap. 1-4.....5c. to 50
Clinoclastite 570.....50c. to 5 00	669 A. Cupromagnesite Ap. 2-14.....5c. to 5 00	Düfeldite Ap. 3-40.....5c. to 5 00
Clinocroite Ap. 3-28.....5c. to 5 00	44 B. Cuproplumbite 42.....2 00	Duxite Ap. 3-40.....5c. to 5 00
Clinophaeite Ap. 3-28.....5c. to 5 00	615 Cuproscheelite 606.....2 00	Dysanale Ap. 3-40.....50 to 1 50
Clintonite 508.....15c. to 1 00	615 A. Cuprotungstite Ap. 2-14.....5c. to 5 00	35 Dyscrasite 35.....25c. to 5 00
Cluthalite 433.....50c. to 1 50	Cuspidite Ap. 3-33.....2 00	185 Dysluite 149.....5c. to 5 00
Coal, Mineral 753.....5c. to 50	324 Cyanite 375.....5c. to 2 00	818 Dysodile 746.....5c. to 50
A. Cobalt, Arsenical Ap. 1-1.....1 00	346 A. Cyanochalcite Ap. 1-4.....5c. to 2 00	422 Dysyntribite 479.....5c. to 50
Cobalt Bloom 558.....10c. to 2 50	670 Cyanochoite 649.....1 00	232 Earth Infusorial 199.....5c. to 50
" Earthy 181.....10c. to 1 00	341 B. Cyanolite 797.....1 00	526 Earthy Cobalt Bloom 559.....5c. to 1 00
" Glance 71.....25c. to 5 00	669 Cyanosite 648.....1 00	237 A. Edelforsite 212.....25
" Pyrites 68.....25c. to 3 00	703 Cyanotrichite 666.....1 50 to 3 00	247 Edenite 235.....5c. to 1 00
" Tin White 70.....25c. to 2 50	310 A. Cyclopole 340.....10c. to 2 00	371 Edingtonite 417.....5c. to 1 00
Cobaltite 71.....25c. to 5 00	401 A. Cymatolite 455.....10c. to 2 00	Edisonite A. J. S. 36-272.....5c. to 1 00
Cobaltomeneite Sm. '82.....1 50	792 Cymole 737.....25c. to 2 00	496 Edwardsite 539.....5c. to 2 50
Coccolite 117.....5c. to 5 00	273 Cyprine 276.....25c. to 2 00	273 Egeran 276.....5c. to 2 50
Cockscorn Pyrites 75.....5c. to 5 00	Cyrrusite Ap. 3-33.....75	Eggonite Ap. 3-40.....5c. to 1 00
Coccolite 215.....5c. to 2 50	272 B. Cyrtolite 275.....5c. to 1 00	231 Egyptian Jasper 189.....25c. to 1 00
C. Coeruleolactite Ap. 1-3.....5c. to 2 50	Dahlite A. J. S. 37-77.....5c. to 1 00	543 Ehlite 568.....50c. to 1 00
Colemanite Sm. '84.....5c. to 10 00	59 Delamanzite 51.....5c. to 50	404 B. Ehrenbergite 458.....50
Collyrite 420.....10c. to 50	430 Damourite 487.....15c. to 50	Eisen, <i>see</i> Iron.....5c. to 2 50
Colophonte 269.....5c. to 50	94 Danaite 78.....50c. to 1 00	181 Eisenrose 143.....25c. to 2 50
Coloradoite Ap. 3-29.....35c. to 3 00	270 Danalite 265.....25c. to 1 00	Ekdemite Ap. 3-41.....5c. to 1 00
Columbite 515.....5c. to 5 00	286 Danurite 299.....5c. to 2 50	300 Ekebergite 324.....10c. to 1 00
Comptonite 424.....10c. to 1 50	117 Dark-red Silver 94.....25c. to 10 00	436 Ekmannite 490.....50c. to 1 00
Conarite 405.....5c. to 5 00	39 Darwinite 37.....5c. to 5 00	304 Elaeolite 328.....5c. to 1 50
Condurrite 37, 797.....25c. to 3 00	327 Datolite 380.....5c. to 5 00	782 Elastic Bitumen 734.....5c. to 50
Conichalcite 565.....10c. to 1 50	Daubreilite Ap. 3-34.....5c. to 5 00	782 Elaterite 734.....5c. to 50
Conite 682.....5c. to 5 00	Daubreite Ap. 3-35.....5c. to 5 00	232 Electrosilicon 198.....10c. to 50
Connellite 827.....1 50 to 5 00	Davreuxite Ap. 3-35.....2 00	524 Eleonoreite Ap. 3-13.....50c. to 1 50
Cookeite 489.....10c. to 1 00	Davyne 327.....50c. to 2 00	209 Eliasite 175.....5c. to 1 00
Copal, Copalite 739.....5c. to 50	Dawsonite Ap. 2-16.....20c. to 2 00	380 Ellagite 430.....5c. to 5 00
Copallite, insects 10.....5c. to 1 50	777 Decatrylene 729.....1 00	Elpasolite Sm. '85.....5c. to 1 50
Copiapite 655.....10c. to 5 00	619 Decenite 609.....1 00	Elroutite Ap. 3-41.....75c. to 1 50
Copper 14.....10c. to 5 00	335 Degerolite 489.....1 25	141 Embolite 115.....25c. to 5 00
" Arsenate 564.....10c. to 3 40	178 A. Delafossite Ap. 2-16.....5c. to 1 00	254 Emerald 243.....1 00 to 10 00
" Arsenical 36.....25c. to 3 00	316 Delawarite 356.....15c. to 50	747 " Nickel 710.....15c. to 1 00
" Blue 715.....5c. to 5 00	497 Dellessite 497.....10c. to 75	179 Emery 138.....5c. to 1 00
" Chloride 121.....25c. to 1 50	558 Delvauxite 583.....25c. to 50	459 Emerylite 606.....15c. to 1 00
" Glance 52.....10c. to 5 00	403 Demidoffite 403.....1 50	Emmonsite A. J. S. 31-476.....5c. to 5 00
" Gray 101.....10c. to 5 00	Dendrites 181.....5c. to 50	Empholite Sm. '83.....5c. to 1 50
" Green 713.....5c. to 5 00	218 Dendritic Manganese 181.....5c. to 50	102 Empholite 86.....5c. to 2 00
" Mica 571.....25c. to 2 00	159 Derbyshire Spar 123.....10c. to 2 50	132 Enargite 107.....25c. to 2 00
" Nickel 60.....25c. to 2 00	41 A. Dermatin 471.....5c. to 50	775 Endecatylene 729.....5c. to 3 00
" Oxyd 133.....5c. to 5 00	620 Descloizite 609.....50c. to 10 00	Endlicheite Sm. '85.....1 00 to 3 00
" Phosphate 563.....10c. to 1 50	Destineite Sm. '82.....1 00	234 Enstatite 208.....10c. to 2 00
" Purple 41.....15c. to 5 00	702 Devilline 665.....5c. to 50	Enysite Ap. 3-42.....10c. to 1 00
" Pyrites 65.....5c. to 5 00	413 Deweyite 469.....5c. to 25	617 A. Eosite Ap. 1-5.....5c. to 1 50
" Red 133.....5c. to 5 00	Diabantite Ap. 3-37.....5c. to 50	560 Eosphorite Ap. 3-24.....1 50
" Silicate 402.....10c. to 3 50	236 Diacrasite 210.....5c. to 1 00	122 A. Epiboulangerite Ap. 1-5.....1 00
" Sulphure 75.....5c. to 5 00	Diadelphite Sm. '84.....5c. to 1 00	441 Epichlorite 493.....75
" Vitreous 52.....5c. to 5 00	580 Diadochite 588.....50	276 Epidote 281.....5c. to 5 00
Copperas 646.....25 c. to 1 00	238 Diallage (green) 215.....10c. to 50	132 A. Epigenite Ap. 1-5.....1 00
Copperasine 660.....50	" Metalloidal 208.....10c. to 2 00	490 E. Epiphosphorite 535.....1 50
B. Coprolites 534.....5c. to 25	722 Diallogite 691.....10c. to 2 50	393 Epistilbite 443.....5c. to 1 50
Cocumbite 650.....5c. to 1 50	24 Diamond Bort 21.....75c. to 10 00	661 Epsomite 643.....10c. to 1 00
Cordierite 299.....50c. to 2 50	24 Diamond (crystal) 21.1 00 to 35 00	278 Erdmannite 285.....25c. to 1 00
Cornish Diamond 189.....25c. to 1 00	474 Diantite 516.....1 00	544 Erinite 569.....50c. to 1 00
Cornwallite 569.....2 00	113 A. Diaphorite Ap. 1-4.....1 00 to 3 00	Erlanite 797.....50c. to 1 00
Coronguite Ap. 3-30.....1 00	208 Diaspore 168.....15c. to 2 00	49 Erubescite 44.....5c. to 5 00
Corundophyllite 504.....5c. to 1 00	287 Dichroite 299.....25c. to 1 00	526 Erythrite 558.....5c. to 2 50
Corundum 137.....5c. to 5 00	Dickinsonite Ap. 3-37.....1 00 to 3 00	148 A. Erythrosiderite Ap. 2-19.....5c. to 5 00
Corydite 74.....50c. to 1 00	Dietrichite Ap. 3-38.....25c. to 75	Erythrozincite Sm. '82.....5c. to 5 00
A. Cosalite 797.....1 50	Dihydrothenardite A. J. S. 35-418.....5c. to 75	Esmarkite Ap. 2-19.....50
Cossyrite Ap. 3-31.....5c. to 2 50	375 A. Dillinite 421.....25c. to 75	269 Essonite 266.....5c. to 2 50
Cotton Stone 598.....10c. to 1 50	185 A. Dimagnetite 151.....5c. to 1 50	668 A. Ettringite Ap. 2-19.....50c. to 1 00
Cotunnite 117.....25c. to 1 00		42 Eucairite 39.....1 50 to 2 50

A. E. FOOTE'S CATALOGUE OF MINERALS.

289	Euchlorite Ap. 3-80.....	50c. to 1 00	269	Garnet 265.....	5c. to 5 00	779	Hatchettite 731.....	50c. to 5 00
540	Euchroite 566.....	2 50 to 10 00	416	A. Garnierite Ap.2-23.5c. to	3 00	780	Hatchettolite Ap. 3-56.....	1 50 to 10 00
326	Eucrase 379.....	2 50 to 10 00	739	Gay, Jussite 706.....	25c. to 50	76	Hauerite 64.....	1 50 to 10 00
	Eucrasite Ap. 3-43.....	1 00 to 5 00	170	Gearsutite 130.....	50c. to 1 25		Haughtonite Ap. 3-77.....	25c. to 50
	Eucryptite Ap. 3-44.....	1 00 to 5 00		Gedantite Ap. 3-51.....	25c. to 50	195	Hausmannite 162.....	25c. to 50
255	Eudialyte 248.....	1 00 to 5 00	246	Gedrite 231.....	25c. to 50	307	Haydenite 332.....	25c. to 50
384	Endonophite 433.....	75	321	Gehlenite 370.....	25c. to 1 00	386	Haydenite 435.....	25c. to 50
260	Eulysite 259.....	50	416	Genthite 471.....	25c. to 1 00	602	Hayesine 599.....	5c. to 10
336	Eulytite 391.....	1 25	822	Geocrellite 748.....	50c. to 1 00	327	Haytorite 332.....	50c. to 1 00
198	A. Eumanite 165.....	50	796	Geocerite 738.....	50c. to 1 00	630	Heavy Spar 616.....	5c. to 10
807	Euosomite 743.....	50	129	Geocronite 105.....	50c. to 1 00	503	B. Hebronnite Ap. 2-27.5c. to	25c. to 50
432	Euphyllite 488.....	75	231	Geode Quartz 196.....	10c. to 1 00	238	Hedenbergite 215.....	25c. to 50
492	Eupyrchroite 530.....	10. to 1 25	797	Geomyricite 739, 798.....	50c. to 1 00	494	Hedylphane 537.....	75c. to 1 00
619	Eusynchroite 609.....	1 00		Gerhardtite Sm. '85.....	50c. to 1 00		Heldburgite Ap. 3-56.....	50c. to 1 00
479	Euxenite 521.....	25c. to 1 50	86	Gersdorffite 72.....	50c. to 3 00	231	Heliotrope 194.....	50c. to 1 00
571	Evansite 585.....	50c. to 1 00	232	Geyerite 199.....	25c. to 1 00	271	Helvite 264.....	50c. to 1 00
231	Eye-Agatz 189.....	1 50 to 5 00	212	Gibbsite 177.....	10c. to 1 00		Hemafibrite Sm. '84.....	50c. to 1 00
125	Fahlerz 100.....	50c. to 1 00	715	Gibraltar Stone 680.....	25c. to 1 00	180	Hematite 140.....	50c. to 1 00
426	Fahlunite 481.....	75c. to 1 25	422	Giesekite 479, 329.....	15c. to 1 00	206	" Brown 172.....	50c. to 1 00
	Fairfieldite Ap. 3-45.....	1 00 to 5 00	422	Giantolite 480.....	50c. to 1 00		Henwoodite Ap. 3-57.25c. to	25c. to 50
231	False Topaz 189.....	15c. to 1 50	429	A. Gilbertite 798 Ap. 2-24.25c. to	3 50	90	Hepatic Pyrites 75.....	50c. to 1 00
132	B. Fanatinite Ap. 2-20.50c. to	1 50	439	Gillinite 492.....	50c. to 1 00	184	Hercynite 148.....	10c. to 50
378	Fargite 423.....	50		Ginilite Ap. 3-51.....	50c. to 1 00	504	Herrderite 546.....	1 50 to 10 00
377	Fargelite 424.....	50c. to 1 00	372	Gismondite 418.....	25c. to 1 00		Herrngrundite Ap. 3-57.10c. to	25c. to 50
238	Fassaitite 216.....	25c. to 1 25	420	Glaserite 476.....	50c. to 1 00	388	Herschelite 437.....	50c. to 1 00
385	Faujasite 433.....	50	316	Glassy Feldspar 355.....	15c. to 1 00	335	Hessenbergite 762.....	50c. to 1 00
663	Fauserite 645.....	75	640	Glauberite 627.....	10c. to 1 00	58	Hessite 50.....	1 50 to 10 00
260	Fayalite 258.....	50	93	A. Glaucochryse Ap. 1-6.....	1 00		Hetaerolite Ap. 3-58.....	50c. to 1 00
112	Feather Ore 91.....	50c. to 1 50	55	Glaucochryse 80.....	50c. to 1 50	112	Heteromorphite 91.....	25c. to 50
316	Feldspar 352.....	5c. to 5 00	409	Glauconite 462.....	5c. to 50	218	Heterogenite Ap. 2-27.....	50c. to 1 00
551	" Blue 572.....	5c. to 2 00	251	Glauconite 444.....	25c. to 1 00		Heubachite Ap. 3-58.....	50c. to 1 00
316	" Glassy 355.....	25c. to 1 50	293	Glimmer 309.....	5c. to 2 00	394	Heulandite 444.....	25c. to 50
316	A. " Green Ap. 3-80.5c. to	25 00	259	Glinkite 256.....	25c. to 1 00	247	Hexagonite Ap. 3-5.....	50c. to 1 00
316	" " avaturine 355.25c. to	1 00	568	Globosite 584.....	25c. to 1 00	476	Hielmte 519.....	50c. to 1 00
316	" " pink 332.....	25c. to 5 00	636	Glocknerite 662.....	50c. to 1 00	722	Himbeerspath 691.....	50c. to 1 00
311	" Labrador 311.25c. to	2 00	420	Glossecollite 476.....	50c. to 1 00	519	Hircite 747.....	50c. to 1 00
316	Felsite 352.....	5c. to 25	387	Gmelinite 436.....	25c. to 5 00	435	Hisingerite 489.....	50c. to 1 00
316	" sphaerulite 359.5c. to	50	316	Gneiss 359.....	5c. to 1 00	149	Hissloppe 463.....	50c. to 1 00
695	Felsobanite 662.....	1 00 to 2 00		1 Gold 3.....	25c. to 10 00	556	Hitchcockite 577.....	50c. to 1 00
	Fer Vide Iron.....	1 00 to 5 00		11 Gold Amalgam 14.....	1 50 to 5 00	522	Hoernesite 556.....	50c. to 1 00
612	Ferberite 601.....	1 00	422	Gonyite 480.....	50c. to 1 00		Hofmannite Ap. 3-59.....	50c. to 1 00
483	Fergusonite 524.....	50c. to 2 00	254	Goshenite 245.....	10c. to 1 00		Hoffmannite A.J.S. 36-155.....	50c. to 1 00
685	Fibrolite 656.....	25c. to 1 50	666	Goslarite 647.....	25c. to 1 00		Homilite Ap. 3-59.....	50c. to 1 00
323	Fibrolite 373.....	5c. to 1 00	204	Gothite 169.....	5c. to 3 50	828	Honeystone 750.....	25c. to 50
784	Fichtelite 735.....	1 00		Goyazite Sm. '84.....	50c. to 1 00	231	Hone Stone 195.....	50c. to 1 00
565	Fichtite 590.....	75	880	A. Grahamite 753.....	10c. to 25	500	Hopite 544.....	50c. to 1 00
	Fiedlerite A.J.S. 95-418.....	50c. to 1 50	247	Grammatite 238.....	10c. to 50	81	A. Horbachite Ap. 2-28.....	50c. to 1 00
422	Figure Stone 480.....	25c. to 1 50	316	Granite 359.....	5c. to 25	247	Hornblende 235.....	50c. to 1 00
	Filowite Ap. 3-47.....	50c. to 1 00	316	" Graphite 359.....	5c. to 25	235	" Labrador 209.....	50c. to 1 00
232	Fiorite 199.....	50	98	Graphite Tellurium 81.25c. to	5 00	140	Horn Silver 114.....	10c. to 50
115	Fire blende 93.....	5 00 to 20 00	25	Graphite 24.....	5c. to 1 00	231	Horn Stone 195.....	15c. to 50
715	Fire Marble 679.....	25c. to 2 50	364	Green Star Stone 412.10c. to	5 00	49	Horse-Flesh Ore 45.....	50c. to 1 00
232	Fire Opal 198.....	5c. to 5 00	409	Green Earth 432.....	5c. to 50		Horsfordite A.J.S. 36-155.....	50c. to 1 00
565	Fischerite 682.....	1 00	69	Greenockite 59.....	15c. to 5 00	238	Hortonsite 222.....	25c. to 50
231	Flexible Sandstone 195.5c. to	1 00	329	Greenovite 385.....	1 25 to 5 00	239	A. Hortonolite Ap. 1-7.25c. to	25c. to 50
231	Floint 195.....	5c. to 25	453	Grengesite 502.....	50c. to 1 00	214	Houghtite 179.....	15c. to 50
232	Floint Stone 199.....	25c. to 1 00	29	Gray Antimony 29.....	10c. to 25 00	744	Hovite 708.....	50c. to 1 00
724	Floerite 694.....	5c. to 5 00	125	Gray Copper 101.....	10c. to 5 00	601	Hovite 598.....	10c. to 50
163	Fluellite 126.....	1 00 to 3 00		Griqualandite A.J.S. 34-73.5c. to	2 00		Huantajayite Ap. 3-60.....	50c. to 1 00
162	Fluocerite 126.....	75	427	Groppite 486.....	1 00	44	A. Huascolite 42.....	50c. to 1 00
161	Fluocerite 126.....	1 00	269	Grossularite 266.....	15c. to 1 50	111	Hübnerite 603.....	50c. to 1 00
159	Fluorite 123.....	5c. to 15 00	330	Grothite 383.....	50c. to 1 00	238	Hudsonite 216.....	25c. to 50
159	Fluor Spar 123.....	5c. to 15 00	55	Grünauite 47.....	50c. to 1 00		Huntillite Ap. 3-71.....	50c. to 1 00
159	" Green 123.....	5c. to 10 00	458	B. Guadalucazeite Ap. 2-25.1 00 to	3 00	758	Humboldtite 718.....	50c. to 1 00
159	" with moving bubble. 50c. to	1 50	490	D. Guano 535.....	10c. to 1 00		Huminite Ap. 3-60.....	50c. to 1 00
99	Foliated Tellurium 82.50c. to	5 00		Guanajuatite Ap. 3-53.1 00 to	10 00	319	Humite 364.....	25c. to 50
715	Fontainebleau Limes. 50c. to	2 50	632	A. Guanovulite Ap. 2-64.....	50c. to 1 00	531	Hureaulite 561.....	25c. to 50
232	Forcherite 199.....	25c. to 1 50	328	Guarinite 383.....	50c. to 1 00	310	C. Huronite 340.....	25c. to 50
392	A. Foresite Ap. 2-22.50c. to	2 00		Guejarite Ap. 3-54.....	50c. to 1 00	597	A. Huyssennite 799.....	50c. to 1 00
218	Forest Rock 187.....	5c. to 1 00		Gütermannite Sm. '84.50c. to	1 50	420	E. Hverfira 478.....	50c. to 1 00
257	Forsterite 255.....	15c. to 50	422	A. Gümbellite Ap. 1-6.....	50c. to 1 00	681	Hversalt 655.....	25c. to 50
231	Fortification Agate 194.15c. to	5 00	216	Gummite 179.....	10c. to 3 50	272	Hyacinth 274.....	15c. to 50
241	Fowlerite 225.....	5c. to 5 00	716	Gurhofite 682.....	1 50	232	Hyalite 199.....	15c. to 50
492	Francolite 531.....	50	813	Guyaquillite 745.....	50c. to 1 00	253	A. Hyalomelan 245.....	50c. to 1 00
	Franklandite Ap. 3-48.....	50c. to 1 00	413	Gymnite 469.....	5c. to 50	259	Hyalosiderite 257.....	25c. to 50
188	Franklinite 192.....	5c. to 10 00	654	Gypsum 637.....	5c. to 2 50		Hyalotekite Ap. 3-60.....	50c. to 1 00
125	Freibergite 101.....	25c. to 75	342	Gyrolite 398.....	1 00 to 2 00	313	Hyalophane 345.....	50c. to 1 00
114	Freieslebenite 93.....	3 00	66	Haarkies 56.....	15c. to 5 00	212	Hydrargillite 177.....	10c. to 50
399	French Chalk 451.....	5c. to 25	169	A. Hagemannite 130.15c. to	1 50	761-766	Hydrid, Pentylite, etc. 720	50c. to 1 00
20	A. Frenzelite Ap. 2.22.1 00 to	10 00	517	Haidingerite 552.....	1 50	490	G. Hydroapatite 535.....	25c. to 50
	Freyalite Ap. 3-48.....	50c. to 1 00	66	Hair Nickel 56.....	15c. to 5 00		Hydrocastorite Ap. 3-61.....	50c. to 1 00
	Friedelite Ap. 3-48.....	50c. to 1 00	138	Halite 112.....	5c. to 1 00		Hydrohalite Ap. 2-29.....	50c. to 1 00
293	Fuchsite 311.....	10c. to 1 00	415	C. Hallite Ap. 2-26.....	10c. to 1 00		Hydrohodonite Ap. 3-61.....	50c. to 1 00
	Fulgurite.....	5c. to 50	420	Halloysite 475.....	15c. to 1 00		Hydrophilite Ap. 2-29.....	50c. to 1 00
299	Gabbroite 324.....	25c. to 50	681	Halotrichite 654.....	15c. to 75	596	Hydroboracite 595.....	50c. to 1 00
282	Gadolinite 293.....	5c. to 25 00		Hanksite, Sm. '85.....	25c. to 10 00		Hydrocerussite Ap. 3-61.....	50c. to 1 00
185	Gahnite 149.....	5c. to 5 00		Haunayite Ap. 3-55.....	50c. to 1 00		Hydrochrysoite Ap. 2-28.10c. to	25c. to 50
378	Galactite 427.....	50c. to 1 00	390	Harmotome 439.....	25c. to 5 00	634	A. Hydrocyanite Ap. 2-29.....	50c. to 1 00
44	Galenite 451.....	5c. to 5 00	831	Hard Coal 755.....	5c. to 25	741	Hydrodolomite 708.....	10c. to 50
	Galenobismutite Ap. 3-49.....	50c. to 1 00	61	C. Harrisite 53.....	2 50		Hydrogobertite Sm. '85.....	50c. to 1 00
	Ganomaltite Ap. 3-49.....	1 00	785	Hartite 736.....	50c. to 1 00	740	Hydromagnesite 707.10c. to	50c. to 1 00

A. E. FOOTE'S CATALOGUE OF MINERALS.

chromica.....5c. to 50	269 E. Jelletite 269.....75c. to 1 50	Lautite Ap. 3-67.....2 50
drophane 199.....50c. to 1 25	245 Jenkinite 470.....25c. to 1 50	316 Lava 359.....5c. to 1 00
drophite 470.....75	233 Jernschite 201.....1 50	526 B. Lavendulan 500.....25c. to 1 50
Hydrosilicite 799.....50	Jeromejefite Sm. '83.....1 00	Lavenite Sm. '85.....2 50
drostearite 438.....25	831 Jet 755.....15c. to 1 00	Lawrencite Ap. 3-67.....2 50
drous Pyrites 75.....2 50	273 Jevreinite 277.....1 50	644 A. Laxmannite Ap. 1-9.....2 50
Anthophyllite 242.....5c. to 75	705 Johannite 666.....1 00 to 3 00	316 Lazurite 353.....25c. to 5 00
Bibasic Arsenite of Ni & Co. 560	440 Jollyite 492.....1 00 to 15 00	551 Lazurite 572.....15c. to 2 50
" A ₂ O ₃ & CuO Phosphate 587	107 Jordanite 88.....1 00 to 3 00	15 Lead 17.....1 00 to 3 00
drotalcite 178.....10c. to 1 00	32 Joseite 31.....2 50	119 " Antimonial Sulphid. 10c. to 10 00
Hydrotrochite 260.....75	645 Jossaitite 631.....2 50	44 " Argentiferous 41.....5c. to 2 00
drotitanite Ap. 3-91. 10c. to 2 00	127 A. Julianite Ap. 1-8.....75	494 " Arsenate 537.....10c. to 3 50
drozincite 711.....10c. to 1 00	721 Junckerite 688.....5c. to 5 00	25 " Black 24.....5c. to 1 00
Hydrophilite Ap. 2-29.....75	193 Jurinite 164.....5c. to 10 00	729 " Carbonate 700.....10c. to 5 00
persthene 209.....15c. to 2 50	K German often equals C English	733 " Chloro-Carb. 703.....5c. to 5 00
pochlorite 392.....50	Kainosite A. J. S. 31, 476.....1 00	642 " Chromate 628.....50c. to 5 00
posclerite 359.....75	674 Kalinite 652.....1 00	617 " Molybdate 697.....5c. to 25 00
postillite 441.....1 00	Kalk, see Lime.....1 00	493 " Ore, Green 535.....10c. to 3 00
statite 144.....25c. to 75	656 A. Kaluzite Ap. 2-54. 10c. to 3 00	617 " " Yellow 607.....5c. to 25 00
land spar 677.....5c. to 10 00	448 Kammererite 496.....25c. to 1 00	150 " Oxy-Chlorid 119.....25c. to 5 00
thyophthalmitite 415. 25c. to 25 00	494 Kamyphite 537.....25c. to 2 50	197 " Oxyd 163.....50c. to 3 50
calite 738.....50c. to 1 00	73 Kancite 61.....75	493 " Phosphate 535.....10c. to 5 00
crease 275.....15c. to 5 00	419 Kaolinite 473.....5c. to 50	729 " Spar 700.....10c. to 5 00
esiasite 700.....75c. to 5 00	554 A. Kapnicite 576.....50	633 " Sulphate 622.....15c. to 5 00
leite Ap. 3-62.....75	223 Karelinitite 185.....1 00	616 " Tungstate 606.....25c. to 5 00
site Ap. 3-62.....75	632 Karstenite 621.....25c. to 75	621 " Vanadate 610.....5c. to 15 00
uenite 144.....5c. to 2 00	241 Keatingine Ap. 3-104. 15c. to 1 00	633 " Vitriol 622.....25c. to 5 00
lsemannite Ap. 1-7.....75	420 F. Kefekilite 478.....50	729 " White 700.....10c. to 5 00
ite 296.....25c. to 3 00	Kentrolite Sm. '82.....1 00	635 Leadhillite 624.....1 00 to 10 00
lianite 337.....25c. to 1 00	331 Keilhauite 387.....1 00	Leather, Mt. Ap. 3-94. 10c. to 1 00
licolite 367.....25c. to 2 00	226 Kermesite 186.....25c. to 1 00	57 Leberblende 50.....75
durated Tale 452.....5c. to 25	414 Kerolite 470.....15c. to 50	632 Lecontite 635.....75
obromite Ap. 3-63.....75	447 A. Kerrite Ap. 2-31.....1 00	387 Ledererite 437.....1 50 to 5 00
lyrite 117.....1 00 to 7 50	712 Kerstenite 689.....1 00	329 Lederite 385.....5c. to 1 50
ite 299.....10c. to 3 50	206 Kidney-Stones 172.....5c. to 50	316 Leelite 353.....15c. to 50
nite Ap. 3-63.....75	Kiesel equals Silica.....1 00	47 Lehrbachite 44.....75
adomine 12.....10c. to 1 00	655 Kieserite 641.....10c. to 75	378 Lehuntite 426.....50
an 15.....25c. to 10 00	422 Killinite 480.....50	Leidyite Ap. 3-68.....10c. to 1 00
Alum 654.....15c. to 75	732 Kischitumite 703.....1 00	316 Lennilite 355.....25c. to 1 00
Arsenate 578.....25c. to 2 00	495 A. Kjerulfine Ap. 2-31.....1 00	343 A. Leonhardtite 401.....50c. to 1 00
" Cupreous 574.....15c. to 1 25	121 A. Klapprotholite Ap. 1-8.....1 00	204 Lepidokrokitite 170.....15c. to 1 00
Arsenical 78.....10c. to 2 00	468 Klipsteinite 511.....50	294 Lepidolite 314.....5c. to 1 50
Carbonate 688.....5c. to 5 00	263 Knebelite 260.....75	290 Lepidomelane 307.....50c. to 1 00
Chromic 153.....5c. to 50	123 Kobellite 99.....75	703 Lettsonite 666.....1 50 to 3 00
Earth, Blue 556.....5c. to 3 00	483 A. Koebelite Ap. 1-8.....50	691 Leucanterite 660.....50
Flint.....5c. to 50	276 A. Kolbingite 284.....1 00	451 Leuchtenbergite 500.....1 50
Glance 140.....5c. to 5 00	247 B. Koeharofite 242.....1 00	309 Leucite 334.....5c. to 2 00
Magnetic 149.....5c. to 5 00	238 Kolkolith 275.....10c. to 50	Leucochalcite Sm. '82.....2 00
Meteorite 16.....25c. to 10 00	518 A. Kollophan Ap. 1-9.....1 50	8 6 Leucopetrite 73.....75
Micaeous 149.....5c. to 1 00	269 Kolophonite 269.....5c. to 1 50	264 Leucophanite 260.....25c. to 1 00
Oxyd 140.....5c. to 5 00	10 A. Kongsbergite Ap. 2-32.....1 00	91 Leucopyrite 75.....25c. to 1 00
Phosphate 594.....5c. to 3 00	Koninkite Sm. '84.....1 00	Leucotile Ap. 3-69.....1 00
Roses 143.....50c. to 5 00	793 Konilitite 737.....1 00	382 Levynite 431.....50c. to 1 00
Rutile 169.....5c. to 2 50	471 A. Koppite Ap. 2-32.....1 00	535 Libethenite 563.....10c. to 2 50
Silicate 243.....5c. to 2 00	493 A. Korarveite Ap. 2-32.....2 00	422 Liebenereite 479.....50
Spar, Spathite 698.....5c. to 5 00	719 Korund 138.....5c. to 2 00	754 Liebigite 717.....2 00
Spectular 140.....5c. to 5 00	450 Kotschubeite 498.....2 00	284 Lievrite 296.....10c. to 3 50
Stone, Blue 555.....5c. to 3 00	330 Kottigite 561.....50	118 Light Red Silver 96.....50c. to 10 00
" Clay 141.....5c. to 50	363 Koupfolite 410.....50	831 Lignite 755.....5c. to 5 00
Ore, Bog 172.....5c. to 25	316 Kralbite 359.....50	443 Lillite 493.....1 00
" Brown 172.....5c. to 50	799 A. Krantzite 741.....50	414 A. Limbachite Ap. 2-31.....1 00
" Green 583.....10c. to 3 00	185 Kreitonite 149.....75	715 Lime Carbonate 670.....5c. to 10 00
" Ochreous 140-169. 5c. to 25	149 Kremersite 119.....75	7 1 B. Lime Malachite 715. 25c. to 1 50
Ore, Octahedral 149. 10c. to 5 00	378 Krokallite 426.....50	573 Lime Uranite 585.....5c. to 2 50
" Red 140.....5c. to 25	Kronnikite Ap. 3-66.....50	715 Limestone 678.....5c. to 25
" Titanite 143.....5c. to 2 00	164 Kryolith 126.....5c. to 2 00	213 Linnite 178.....25c. to 1 00
" Jaspersy 141. 10c. to 50	501 Kuhnite 544.....1 00	206 Linonite 172.....5c. to 1 00
Pyrites 62.....5c. to 2 00	12 Kupfer, see Copper 14.....50	700 Linarite 663.....25c. to 5 00
" Arsenical 78. 10c. to 2 00	172 Kupferblüthe 173.....10c. to 2 50	583 Lindackerite 590.....1 00
" Magnetic 58. 10c. to 5 00	71 Kupfernickel 60.....25c. to 3 50	81 Linnæite 68.....25c. to 3 50
" White 75.....5c. to 5 00	345 Kupferite 230.....1 00	310 Linseite 340.....75
Sinter 574.....15c. to 50	121 Kyanite 375.....5c. to 2 00	542 Linoconite 597.....1 00 to 5 00
Spinel 148.....10c. to 5 00	90 Kyrosite 76.....50	Liskeardite Ap. 3-70.....25c. to 1 00
Iserite 145.....15c. to 50	31 Labradorite 841.....5c. to 2 00	294 " Tourmaline 367. 10c. to 10 00
Isoclasite Ap. 1-7.....75	605 Lagonite 600.....75	218 D. Lithophorite Ap. 1-9. 25c. to 1 50
Isopyre 392.....25c. to 1 00	697 Lampoprophanite 663.....1 00	Lithographic Stone 679.....5c. to 25
columnite 195.....10c. to 1 00	641 Lanarkite 628.....1 00 to 5 00	10c. to 50
nerite 333.....50	Laubanite A. J. S. 35-418.....1 00	409 Lithomarge 460.....10c. to 50
arite 391.....50	740 Lancasterite 708.....25c. to 1 50	Lithophyllite Ap. 3-124. 50c. to 1 25
Ivigitite Ap. 1-7.....25c. to 3 50	Langbanite A. J. S. 34-72.....1 50	29 A. Livingstonite Ap. 2-35. 50c. to 2 50
lyte 736.....1 00	702 Langite 665.....25c. to 1 50	186 Lodestone 149.....5c. to 5 00
eksonite 411.....25c. to 1 00	Lansfordite A. J. S. 36-156.....50	93 Löfingite 77.....75
Jacobite Ap. 1-8. 25c. to 1 00	745 Lanthanite 709.....50	90 Lonchidite 76.....50
Jadeite, Jade 292.....50c. to 2 00	306 Lapis Lazuli 341.....10c. to 5 00	690 Löweite 643.....75
mesonite 90.....25c. to 1 00	604 Larderelite 600.....50	690 Löwigite 659.....1 00
rgoon 273.....1 50	343 Laumonite 399.....5c. to 1 00	316 Loxoclase 355.....5c. to 50
rosite 660.....1 25	Laurionite A. J. S. 35-418.....1 00	Lucasite A. J. S. 32, 375.....2 00
per 195.....5c. to 1 00	89 Laurie 74.....50	Ludlamite Ap. 3-70.....15c. to 2 00
lingite 800.....1 25		595 A. Ludwigite Ap. 2-35. 50c. to 2 00
ferisite 494.....5c. to 1 00		715 Lumachelle 679.....50c. to 2 00
ffersonite 215.....15c. to 2 00		598 A. Lüneburgite Ap. 1-10.....50

A. E. FOOTE'S CATALOGUE OF MINERALS.

231 Lydian-stone 195.....10c. to	50	435 Melanolite 490.....	50	751 " Green 713.....5c. to	50
447 B. Maconite Ap. 2-36.....	1 00	Melanosiderite Ap. 3-75.....	1 00	" Paper Ap. 3-9410.....	1 00
322 Macle 371.....10c. to	1 50	Melanotekite Ap. 3-75.....	1 00	Muckite Ap. 3-83.....	1 00
715 Madrepore Marble 679.25c. to	1 00	664 Melanterite 646.....25c. to	50	232 Mullers Glass 199.....25c.	50
155 Magnesia Chlorid 122.....	1 00	274 Melilite 280.....25c. to	1 00	524 Mullite 556.....5c.	50
269 " Garnet 267.25c. to	75	420 B. Melinite 477.....	25	75 Mundie 62.....5c.	50
597 " Borate 595.25c. to	1 50	268 Meliphanite, Melinophane	1 00	632 Muricite 621.....10c.	1 00
210 " Hydrate 175.10c. to	10 00	828 Mellite 750.....10c. to	1 00	279 Muromontite 289.....	1 00
749 " Hydrocarbonate 707.25c.1 50	1 50	107 A. Melonite 801.....	1 25	293 Muscovite 309.....5c. to	50
187 Magnesioferrite 152.....50c. to	1 50	420 G. Melopsite 478.....	50	293 Muscovy Glass 309.....5c. to	50
718 Magnesite 685.....5c. to	50	181 Menaccanite 143.....5c. to	2 00	731 Musite 702.....	25c. to
186 Magnet, Native 149.....5c. to	5 00	151 Mendipite 120.....50c. to	2 00	238 Mussite 214.....25c. to	50
68 Magnetic Pyrites 58.....5c. to	3 50	677 Mendozite 653.....	50c. to	751 A. Mysorin 715.....	10c. to
186 Magnetite 149.....5c. to	5 00	128 Meneghinite 105.....	50c. to	293 Naacrite 309, 473.....10c. to	1 00
187 Magnoferrite 152.....	75	485 Mengite 525.....	1 00	610 Nadorite Ap. 1-11.....1 00 to	1 00
751 Malachite 713.....5c. to	10 00	232 Menilite 199.....15c. to	1 00	Naesumite Ap. 1-11.....	1 00
751 B. " Lime 715.....	50	8 Mercury 13.....5c. to	2 50	99 Nagygite 82.....50c. to	50
752 " Blue 715.....5c. to	10 00	64 " Sulphide 55.....5c. to	5 00	61 Nailhead Copper Ore 52.50c. to	50
238 Malaccolite 214.....25c. to	1 00	Meroxene 306, Ap. 3-76.25c. to	3 00	715 " Spar 670.....10c. to	1 00
272 A. Malaccon 275.....50c. to	1 50	719 Mesitite 687.....	50	214 A. Namaqualite Ap. 1-11.....	1 00
1 A. Maldonite Ap. 1-10.....	1 00	381 Mesolite, Mesotype 430.5c. to	1 50	146 A. Nantokite Ap. 1-11.....	1 00
Mallardite Ap. 3-72.....	1 00	619 Metabrushite 553.....	1 00	768 Naphtha 723.....10c. to	1 00
Maltha 728.....	50	455 Metachlorite 503.....50c. to	1 00	794 Naphthalin 738.....	10c. to
657 Mamanite 642.....	1 00	64 A. Metacinnabarite Ap. 1-10	1 50	378 Natrolite 426.....10c. to	1 00
241 Mangan Amphibol 225.25c. to	1 50	13 Meteoric Iron 16.....25c. to	50 00	736 Natron 705.....	50c. to
52 " Blende 46.....50c. to	5 00	13 Meteoric Stone 16.....1 50 to	50 00	41 Naumannite 39.....50c. to	50
277 " Epidote 285.....5c. to	1 00	225 A. Meymacite Ap. 2-38.....	75	316 Neocrinite 355.....	50c. to
195 Manganese, Black 162.25c. to	1 50	724 Mexican Onyx 694.....25c. to	1 50	204 Needle Iron Ore 169.....5c. to	50
218 A. " Bog 181.....5c. to	1 00	108 Miargyrite 88.....1 00 to	5 00	124 " Ore 100.....50c. to	50
156 " Chlorid 122.....	1 00	293 Mica 309.....	2 00	724 " Spar 694.....25c. to	50
722 " Carbonate 691.10c. to	3 50	289 " Black 304.....5c. to	1 50	378 " Zeolite 426.....10c. to	1 00
218 " Earthy 181.....5c. to	1 00	548 " Copper 571.....25c. to	2 00	781 B. Neft-gil 734.....	10c. to
199 " Gray 165.....5c. to	2 00	294 Mica-lithia 814.....10c. to	2 00	404 E. Nefedieffite Ap. 2-41.....	1 00
205 " Ore, Hard 170.10c. to	5 00	25 Mica pictoria 24.....50c. to	50	210 Nematite 175.....15c. to	1 00
199 " Oxyd 165.....5c. to	2 00	293 " picture 309.....5c. to	25	Neudorite Ap. 3-84.....	1 00
217 " " Hydrous 180.5c. to	1 00	316 " schist 359.....5c. to	25	Neociano Ap. 3-84.....	1 00
499 " Phosphate 543.15c. to	1 00	288 " star 302.....10c. to	50	553 Neocrite 574.....	50c. to
241 " Red Spar 225.....5c. to	5 00	279 B. Michaelsonite 289.....	50	357 Nectolite 406.....	50c. to
241 " Silicate 225.....5c. to	5 00	316 A. Microcline Ap. 3-80.5c. to	25 00	437 Neoteite 491.....	50c. to
52 " Sulphide 43.....50c. to	5 00	472 Microlite 513.....50c. to	5 00	304 Nephelie 327.....5c. to	50
205 Manganite 170.....10c. to	5 00	316 Microclites App. 2-39.....10c. to	50	Nephrite 801.....	50c. to
725 Manganoalcalite 697.....	1 25	Microplakite Ap. 2-39 } See La-		420 Nertschinskite 476.....	1 00
241 Mangankiesel 691.....5c. to	5 00	Microphyllite Ap. 2-39 } bradorite		423 A. Neurolite 482.....	1 00
722 Manganspath 691.....5c. to	5 00	305 A. Microsomite Ap. 2-39.....	1 00	Newberryite Ap. 3-84.....	1 00
290 A. Manganoophyllite Ap. 2-37	1 00	814 Middletonite 745.....	1 00	Niartinite A. J. S. 35-418.....	1 00
Manganosite Ap. 3-73.....	1 00	232 Milkopal 398.....5c. to	1 00	71 Niccolite 60.....25c. to	1 00
Manganostibiite Sm. '84.....	1 00	66 Millerite 56.....10c. to	5 00	Nicochromite Ap. 3-85.....25c. to	50
715 Marble 678.....5c. to	1 00	465 Miloschite 510.....	50	Nickel Ap. 2-41.....	1 00
715 " Breccia 679.....10c. to	50	494 Minnetite 537.....10c. to	3 50	72 " Antimonial 61.....30c. to	50
715 " Carrara 678.....5c. to	50	831 Mineral coal 753.....5c. to	50	508-509 " Arsenate 548.....	50
715 " Encrinal 679.....15c. to	1 00	782 " caoutchouc 734.5c. to	25	71 " Copper 60.....25c. to	50
715 " Landscape 679.50c. to	3 00	830 " oil 723.....5c. to	25	747 " Emerald 710.....15c. to	50
715 " Madrepore 679.25c. to	1 00	830 " pitch 751.....5c. to	50	75 " Glance 72.....50c. to	50
715 " Parian 678.....15c. to	1 00	798 " resin 739.....5c. to	50	416 " Gynnite 471.....10c. to	1 00
715 " Ruin 679.....25c. to	3 00	419 " soap 473.....10c. to	50	416 " Silicate 471.....10c. to	1 00
411 " Serpentine 494.15c. to	1 00	197 Minium 163.....50c. to	5 00	66 " Sulphid 56.....25c. to	50
715 " Shell 679.....15c. to	1 00	653 Mirabilite 636.....	1 00	231 Nicolo or Onicolo 195.25c. to	50
715 " Sienna 678.....10c. to	50	Mirlidite Ap. 2-40.....	1 00	54 Nicopyrite, Nickel Pyrite.....	1 00
411 " Verd Antique 465.25c. to	10 00	628 Misenite 615.....	1 00	247 G. Nigrescite Ap. 1-12.....	1 00
90 Marcasite 75.....5c. to	5 00	94 Mispickel 78.....10c. to	2 00	193 Nigrin 160.....5c. to	50
241 Marcasine 226.....50c. to	1 00	683 Misy 655.....5c. to	1 50	474 Niobite 515.....5c. to	50
316 Marcasite 339.....10c. to	1 50	Mixite Ap. 3-82.....25c. to	2 00	590 Nitre 592.....25c. to	50
459 Margarite 506.....10c. to	50	301 Mizzonite 325.....50c. to	1 50	591 Nitratine 592.....	50c. to
439 Margarodite 487.....10c. to	1 00	231 Mocha stone 195.....5c. to	1 50	592 Nitrocalcite 593.....	50c. to
393 Marielite 326.....25c. to	1 00	551 Mollit 572.....5c. to	3 50	Nitroglauherite Ap. 2-41.....	1 00
715 Marl 679.....5c. to	25	617 Molybdate of Lead 607.5c. to	25 00	593 Nitromagnesite 594.....	50c. to
Marmatrolite Ap. 3-74.....	1 00	34 Molybdenite 32.....5c. to	2 50	Nocerite Ap. 3-85.....	1 00
56 Marmatite 48.....50c. to	1 00	224 Molybdtite 185.....25c. to	1 50	478 A. Nohlite Ap. 2-41.....	1 00
411 C. Marmolite 435.....10c. to	50	145 Molsite 118.....	50	247 Norallite 236.....	50c. to
655 Martinsite 641.....	50	496 Monazite 539.....5c. to	5 00	247 Nordenskioldite 233.....	50c. to
180 A. Martite 142.....5c. to	1 50	505 Monimolite 546.....	1 00	308 Nosite 333.....25c. to	50
659 Mascagnite 635.....	50	356 Monradite 406.....	50	416 A. Noumacite Ap. 2-23.50c. to	50
309 A. Maskelynite Ap. 2-37.....	1 00	323 Monrolite 373.....	75	231 Novaculite 189.....50c. to	50
458 Masconite 505.....5c. to	1 00	711 Montanite 668.....	1 00	493 Nussierite 535.....	50c. to
177 Massicot 136.....	1 00	258 Monticellite 255.....15c. to	1 50	299 Nuttallite 320.....25c. to	50
150 Matlockite 119.....50c. to	10 00	654 Montmartite 638.....25c. to	50	316 Obsidian 359.....	50c. to
Matricite Ap. 3-74.....	1 00	406 Montmorillonite 459.25c. to	1 00	227 Ochre Antimony 187.10c. to	1 00
635 A. Maxite Ap. 2-38.....	1 00	503 C. Montbrasite Ap. 2-27.5c. to	50	224 " Molybdic 185.....25c. to	50
707 Medjidite 667.....	1 00	814 Moonstone 347.354.....10c. to	2 00	180 " Red 140.....50c. to	50
Meerschalumite Ap. 2-38.....	1 00	396 Mordenite 446.....	1 00	206 " Uranium.....50c. to	50
402 Meerschau 456.....5c. to	1 00	668 Morenosite 648.....	1 00	120 Ochery Iron Ore 140.....5c. to	50
613 Megabastite 604.....10c. to	1 50	361 A. Moresnetite 409.....	75	480 C. Ochran 477.....	50c. to
297 Meionite 318.....15c. to	2 00	231 Mormorion 193.....5c. to	25 00	194 Octahedrite 161.....50c. to	50
178 Melacconite 136.....10c. to	2 00	691 Moronolite 660.....	50	172 Octahedral Copper Ore 133.50c. to	50
498 E. Melanchlor 43.....	1 25	492 Moroxite 531.....25c. to	1 00	186 " Iron Ore 149.....50c. to	50
827 Melanellite 750.....	1 00	231 Moss Agate 195.....10c. to	1 50	433 Ellacherite 489.....	50c. to
Melanocerite A. J. S. 35-417.....	1 00	724 Mossottite 696.....25c. to	1 50	272 D. Erstedite 275.....5c. to	50
830 B. Melanaspalt 753.....	50	283 Mosandrite 295.....50c. to	1 50	Oil, Genesee or Seneca 73.....	50c. to
811 Melanchyme 744.....25c. to	50	Mottramite Ap. 3-83.....	1 00	194 Oisanite 161.....50c. to	50
425 Melanhydrite 483.....	50	Mountain cork Ap. 3-94.25c. to	1 00	341 Okenite 398.....	50c. to
269 E. Melanite 267.....5c. to	2 50				

A. E. FOOTE'S CATALOGUE OF MINERALS.

56 A. Oldhamite Ap. 2-42.....	250c. to 5 00	646 Pettkoite 631.....	50c. to 5 00	543 Prasin 568.....	1 00
180 Oligiste Iron 140.....	5c. to 5 00	58 A. Petzite 51.....	50c. to 5 00	232 Precious Opal 198.....	10c. to 5 00
314 Oligoclase 346.....	25c. to 1 50	234 Phaenite 203.....	50	742 Predazite 708.....	50
536 Olivine 564.....	10c. to 3 50	385 Phacelite 435.....	25c. to 1 00	431 Pegrattite 487.....	50
250 Olivine 257.....	5c. to 2 50	520 Pharmacolite 554.....	50c. to 1 00	363 Prehnite 410.....	15c. to 3 00
411 Ollaris 464.....	5c. to 2 50	558 Pharmacosiderite 578.....	15c. to 2 50	715 Preunnerite 677.....	75
238 A. Omphacite 223.....	50	267 Phenacite 263.....	10c. to 10 00	600 A. Priceite Ap. 2-45.....	10c. to 1 00
204 Onegite 170.....	50c. to 1 50	Phillipite Ap. 3-92.....		452 Prochlorite 501.....	10c. to 2 00
422 Oncosine 480.....	1 00	389 Phillipsite 438.....	25c. to 1 00	171 Prosopite 130.....	1 25
65 A. Onofrite 53.....	75	288 Phlogopite 302.....	5c. to 2 50	Protovermiculite 67.....	5c. to 1 00
231 Onyx 195, 680.....	15c. to 3 00	643 Phoenicochroite 630.....		118 Proustite 96.....	50c. to 10 00
715 Oolite 679.....	5c. to 50	418 Pholerite 472.....	25c. to 75	56 Przibramite 48.....	50c. to 2 00
205 " Iron Stone 172.....	5c. to 50	316 Phonolyte 359.....	25	Pseudobrookite Ap. 3-97.....	
422 Oosite 480.....	75	733 Phosgenite 703.....	25c. to 5 00	Pseudocotunnite Ap. 3-97.1 00	2 50
232 Opal 198.....	5c. to 50 00	524 Phosphate of Iron 556.....	5c. to 3 00	543 Pseudomalachite 568.....	50c. to 1 50
232 " Agate 198.....	10c. to 5 00	493 " Lead 535.....	5c. to 5 00	Pseudonatroite Ap. 3-98.....	
232 " Common 198.....	5c. to 1 00	543 Phosphocalcite 568.....	50	Pseudomorphs, see end of price list	
232 " Fire 198.....	5c. to 50 00	Phosphuranylite Ap. 3-92.....		217 Psilomelane 180.....	5c. to 1 00
232 " Jasper 199.....	10c. to 1 50	492 Phosphorite 531.....	15c. to 50	Psittacinite Ap. 3-98.....	
232 " Precious 198.....	25c. to 50 00	241 B. Photicite 227.....	25c. to 50	624 Pucherite Ap. 1-12.....	25c. to 3 00
232 " Semi 199.....	5c. to 50	317 Phthanite 195.....	75	316 Pumice 377.....	5c. to 25
235 " cut for setting.....	25c. to 50 00	458 A. Phyllite 506.....	5c. to 75	325 Pycnite 319.....	15c. to 1 50
232 " Wood 199.....	10c. to 1 00	825 Physalite 377.....	75	351 Pyralloite 406.....	50
231 Opalized Wood 199.....	10c. to 2 00	830 C. Plauzite 753.....	75	426 Pyrarillite 483.....	1 00
411 Ophiolite 465.....	5c. to 50	678 Pickeringite 653.....	50	117 Pyrarigrite 94.....	25c. to 15 00
468 Opsimose 511.....	50	383 Picromerite 433.....	75	75 Pyrites 62.....	5c. to 5 00
1 Or Natif (Gold) 3.....	25c. to 10 00	Picroaluminogen Ap. 3-93.....	50	94 " Arsenical 78.....	10c. to 2 00
335 Orangite 413.....	50c. to 5 00	Picroepidote Sm. '83.....		75 " Auriferous 75.....	10c. to 1 50
420 D. Oravitite 477.....	75	470 A. Picroilite 512.....		90 " Cockscomb 75.....	5c. to 5 00
Ores, see Iron and various metals		411 Picroilite 465.....	5c. to 1 00	78 " Copper 65.....	5c. to 5 00
Oriental, applied to finer gems		658 Picromerite 642.....	10c. to 1 50	75 " Iron 62.....	5c. to 5 00
Orievite Ap. 1-12.....		520 A. Picropharmacolite 555.....		68 " Magnetite 58.....	5c. to 5 00
27 Orpiment 27.....	10c. to 5 00	352 Picrophyll 406.....	75	90 " Radiated 75.....	10c. to 50
278 Orthite 287.....	10c. to 3 50	377 Picrothompsonite 426.....	1 00	80 " Tin 68.....	10c. to 50
316 Orthoclase 352.....	5c. to 10 00	319 Picrosmine 405.....	50	215 Pyroaurite 179.....	50
316 " Pink 352.....	25c. to 10 00	146 A. Piddingtonite 232.....		471 Pyrochlore 512.....	50c. to 1 50
316 " Twin.....	10c. to 5 00	277 Piddmontite 283.....	25c. to 1 00	211 Pyrochroite 177.....	75
Oshornite Ap. 1-12.....		829 Pigotite 750.....		199 Pyrolusite 165.....	5c. to 1 50
7 Osmiridium 12.....	50c. to 5 00	401 Philite 455.....	50	493 Pyromorphite 535.....	10c. to 5 00
490 A. Osteolite 533.....	25c. to 1 00	Philite Ap. 3-93.....	75	269 Pyrope 267.....	5c. to 50
272 Ostranite 273.....	75	Pilolite Ap. 3-94.....	10c. to 1 00	400 Pyrophillite 454.....	10c. to 1 50
453 A. Otrelite 506.....	10c. to 1 00	460 Pimelite 510.....	75	325 Pyrophysalite 377.....	1 00
260 Ouvarovite 270.....	25c. to 10 00	422 Pinite 479.....	25c. to 1 00	278 Pyrorthite 287.....	50c. to 1 50
460 Owenite 507.....	50	Pipstone 796.....	10c. to 50	781 C. Pyroxipite 734.....	25c. to 75
Oxides, see Iron & various metals		665 Pisanite 645.....		800 Pyrothinite 744.....	50
377 Ozarkite 421, 329.....	10c. to 1 00	715 Pisolite 679.....	5c. to 50	445 Pyroscalerite 493.....	75
780 Ozocerite 732.....	5c. to 50	694 Pissophanite 661.....		369 Pyrosmalite 414.....	50c. to 7 50
163 Pachnolite 129.....	15c. to 2 00	276 Pistacite 281.....	25c. to 1 00	115 Pyrotilpinit 93.....	5 00 to 25 00
96 Pacite 81.....		720 Pistomesite 688.....	50	238 Pyroxene 212.....	5c. to 3 00
422 Pagodite 480.....	15c. to 25	830 Pitch, Mineral 751.....	5c. to 25	837 Pyrrhite 763.....	1 00
241 Palsbergite 225.....	1 00	190 Pitchblende 154.....	25c. to 2 00	68 Pyrrhotite 58.....	5c. to 5 00
425 Palagonite 483.....	50	316 Pitchstone 359.....	15c. to 25	231 Quartz 189.....	5c. to 25 00
5 Paludite 403.....		354 Pitkarandite 405.....	75	231 " Agate 194.....	5c. to 3 00
5 Palladium Native 12.....		830 Pittasphalt 751.....	5c. to 25	231 " Amethystine 193.....	5c. to 25 00
600 A. Pandermite Ap. 3-97.....	10c. to 20	581 Pitticite 589.....	50	231 " Asteriated 193.....	5c. to 1 50
181 Paracolumbite 144.....	5c. to 50	Plagioclite Ap. 3-94.....		231 " Aventurine 193.....	1 00 to 2 00
Paraffin (Coal) 730.....		Plagioclase 802.....		231 " Babel 196.....	50c. to 3 50
431 Paragonite 437.....	50	109 Plagionite 89.....	75c. to 2 50	231 " Basanite 195.....	10c. to 1 00
483 Paraluminite 631.....		554 B. Planerite 576.....	1 00	231 " Black 189.....	5c. to 25 00
238 Paranthine 818.....	50	231 Plasma 194.....	25c. to 75	231 " Bloodstone 194.....	10c. to 3 00
836 Parathorite 763.....	1 00	654 Plaster Stone 637.....	5c. to 1 00	231 " Capped 193.....	25c. to 5 00
247 Pargasite 235.....	10c. to 50	3 Platinum 10.....	10c. to 10 00	231 " Carnelian 194.....	10c. to 1 50
731 Parisite 702.....	3 00	4 Platiniridium 11.....		231 " Cavernous 193.....	25c. to 1 50
231 Pargaschinit 293.....	75	201 Platinerte 167.....	1 00	231 " Cellular 189.....	10c. to 1 00
231 Partzite 188.....	25c. to 1 50	Plomb (or Plumbum) vide Lead		231 " Chalcedonite 194.....	5c. to 10 00
681 A. Pastreite 656.....	50	340 A. Plombierite 802.....	75	231 " Conglomerate 195.....	5c. to 5 00
618 Paternalite 608.....	1 00	25 Plumbago 24.....	5c. to 2 00	231 " Contain'g Asbestos 194	1 50
Pattersonite Ap. 1-18.....		Plumbalophane Ap. 1-12.....		231 " " Anthracite 194.....	10c. to 1 50
233 Paulite 249.....	1 00	556 Plumbogummite 577.....	2 00	231 " " Chlorite 193.....	25c. to 5 00
715 Peastone 679.....	15c. to 25	112 Plumosite 91.....	25c. to 1 50	231 " " Gold 194.....	1 00 to 10 00
716 Pearl Spar 682.....	10c. to 1 50	199 Polianite 166.....	25c. to 1 50	231 " " Góthite 194.....	25c. to 1 50
316 Pearlstone, Pearlite 359.....	10c. to 50	256 Pollicite 249.....	2 00 to 5 00	231 " " Hematite 193.....	25c. to 1 50
831 Peat 758.....	5c. to 25	269 Polyadelphite 269.....	5c. to 1 50	231 " " Hornblende 194.....	15c. to 2 00
399 Pectolite 396.....	5c. to 3 00	40 C. Polyargyrite Ap. 1-12.....		231 " " Liquid 194.....	50c. to 3 00
564 Pegante 582.....	50	Polyarsenite Sm. '85.....		231 " " Rutile 194.....	15c. to 5 00
316 Pele's Hair 360.....	25	131 Polybasite 107.....	1 00 to 15 00	231 " " Silver 194.....	1 00 to 5 00
743 Pencatite 708.....	75	426 Polychroilite 485.....	50	231 " " Stibnite 194.....	50c. to 1 50
448 Penninite 495.....	15c. to 1 50	Polydymite Ap. 3-95.....		231 " " Tourmaline 193.....	25c. to 1 50
741 Pennite 708.....	25c. to 1 00	656 Polyhalite 641.....	25c. to 1 00	231 " " Chrysoprase 194.....	50c. to 2 50
Pennoite Sm. '85.....		442 Polyhydrite 493.....	50	231 " " Drusy 193.....	5c. to 1 00
54 Pentlandite 47.....	50	481 Polykras 523.....	75	231 " " Ferruginous 193.....	5c. to 1 00
154 Percyite 122.....	1 00	238 Polyite 216.....	50	231 " " Fibrous 193.....	25c. to 1 00
173 Periclasite 134.....	75	482 Polymignite 523.....	35c. to 1 00	231 " " Flint 195.....	5c. to 1 00
315 Pericline 350.....	25c. to 2 00	493 Polysphaerite 536.....	50	231 " " Granular 195.....	5c. to 15
239 Peridot 255.....	5c. to 1 50	126 Polytelite 104.....	50	231 " " Greasy 193.....	5c. to 25
315 Peristerite 350.....	10c. to 3 00	231 Porcelain Jasper 195.....	5c. to 50	231 " " Green 189.....	10c. to 5 00
182 Perofskite 146.....	5c. to 5 00	316 Porphyry 359.....	10c. to 1 00	231 " " Hacked 189.....	5c. to 50
316 Perthite 356.....	50c. to 1 00	404 D. Portite 458.....		231 " " Heliotrope 194.....	10c. to 3 00
244 Petalite 229.....	10c. to 1 00	Posepnyite Ap. 3-96.....		231 " " Honestone 195.....	5c. to 25
231 Petrified Wood 196.....	5c. to 5 00	399 Potstone 452.....	15c. to 50	231 " " Honestone 195.....	5c. to 25
767 Petroleum 723.....	15c. to 50	231 Prase 194.....	25c. to 1 00	231 " " Jaspersy 195.....	5c. to 1 00

A. E. FOOTE'S CATALOGUE OF MINERALS.

231 Quartz, Milky 193.....5c. to 1 00	Rogersite Ap. 3-104.....15c. to 1 50	411 Serpentine 464.....5c. to 1 00
231 " Modified 193.....10c. to 5 00	Romeite 547.....1 00	411 " Fibrous 465.....5c. to 1 00
231 " Moss Agate 195.....10c. to 1 50	Roscoelite Ap. 3-104.....1 00 to 5 00	411 " Foliated 465.....15c. to 1 00
232 " Nectique 199.....5c. to 5 00	231 Rose Quartz 193.....5c. to 2 00	411 " Precious 464.....25c. to 1 00
231 " Novaculite 195.....5c. to 25	526 A. Roselite 560.....1 50 to 5 00	Serpierite Sm. '82.....
231 " Onyx 197.....15c. to 3 00	Rosenbuschite A.J.S. 35-417	783 Settling Stones Resin 735.....
231 " Prase 194.....75c. to 2 00	101 Rosite 85.....50	420 Severite 476 and 460.....
231 " Pseudomorphous 196.....5c. to 5 00	807 A. Rosthornite Ap. 1-14.....	461 Seyherite 508.....15c. to 3 00
232 " Resinite 198.....5c. to 5 00	416 Rottsite 471.....75c. to 1 50	715 Shell Marble 679.....15c. to 3 00
231 " Rose 193.....5c. to 2 00	289 Rubellan 307.....25c. to 75	320 Short 365.....5c. to 2 00
231 " Sagenite 193.....15c. to 5 00	320 Rubellite 367.....10c. to 10 00	Siderazot Ap. 3-109.....
231 " Sapphire 193.....10c. to 1 00	56 Ruby Color'd Blende 48.....15c. to 1 50	721 Siderite 688.....5c. to 5 00
231 " Silicified Wood 196.....5c. to 5 00	183 " Spinel 147.....10c. to 5 00	Sideronatrium Ap. 3-109.....
231 " Smoky 189.....5c. to 25 00	179 " Oriental 138.....25c. to 5 00	Siderophyllite Ap. 3-80.....50c. to 2 00
231 " Star (Stern) 193.....50c. to 1 50	117 " Blende 94.....25c. to 15 00	456 A. Sideroschistolite 504.....
231 " Swimming 189.....15c. to 75	118 " Silver 94.....50c. to 15 00	721 Siderosile 688.....5c. to 5 00
231 " Tabular 196.....15c. to 1 50	486 Rutherfordite 526.....	Siegburgite Ap. 2-51.....15c. to 2 00
231 " Vitreous 193.....5c. to 25 00	193 " Rutile 159.....5c. to 10 00	81 Siegenite 68, 69.....25c. to 2 00
231 " Yellow 193.....10c. to 1 00	193 " Eisen Rose 159.....25c. to 2 00	81 Silix 189.....5c. to 25 00
231 Quartzite 189.....5c. to 25	312 Saccharite 345.....25c. to 1 00	346 Silicate of Copper 402.....10c. to 5 00
Quenstedtite A. J. S. 36-156	715 Saccharoidal Limestone.....5c. to 25	416 " Nickel 471.....5c. to 2 00
350 Quincke 406.....50	193 Sagenite 159.....25c. to 1 50	416 " Ytria 804.....
8 Quicksilver, Native 13.....25c. to 3 00	238 Sahlite 215.....15c. to 1 00	361 " Zinc 407.....5c. to 5 00
64 " Sulphur 65.....10c. to 5 00	139 Sal Ammoniac 114.....50c. to 1 50	231 Silicified Coral.....10c. to 1 00
218 E. Rabbionite Ap. 1-13.....	138 Salt, Common 112.....5c. to 2 00	231 " Nuts.....1 00 to 1 00
90 Radiated Pyrites 75.....15c. to 75	661 " Epsom 643.....10c. to 50	231 " Shells 196.....25c. to 3 00
684 Raimondite 656.....	653 " Glaucous 636.....25c. to 1 50	231 " Wood 196.....5c. to 5 00
163 Ralstonite Ap. 1-13.....1 00 to 3 00	590 Saltpetre 592.....50	232 Silicious Sinter 199.....50c. to 1 00
92 Rammelsbergite 77.....75	591 " Chili 592.....5c. to 25	311 Silicite 341.....
Randite Ap. 3-102.....50c. to 1 00	829 A. Salts of Iron, Organic 750	323 Sillimanite 374.....5c. to 5 00
247 Raphanite 233.....50	478 Samarskite 520.....10c. to 5 00	Silber, see Silver.....
877 A. Rauteite Ap. 2-47.....	204 Samoitte 478.....75	2 Silver 9.....10c. to 15 00
428 Rastolite 485.....50	231 Sandstone 195.....5c. to 25	35 " Antimonial 35.....25c. to 5 00
339 Ratholite 395.....25c. to 1 00	316 Sandin 357.....50	117 " Sulphure 95.....25c. to 15 00
26 Rauegelb 26.....50c. to 5 00	417 Saponite 472.....15c. to 50	35 " Arsenical 36.....25c. to 1 00
231 Raue-quartz 189.....5c. to 25 00	179 Sapphire 138.....5c. to 5 00	118 " Ore 96.....50c. to 10 00
406 A. Razumovskite 460.....75	320 " Brazilian 367.....25c. to 5 00	130 " Brittle 106.....50c. to 2 00
26 Realgar 26.....50c. to 5 00	231 " Quartz 193.....10c. to 1 00	142 " Bromic 116.....1 00 to 5 00
Reddingite Ap. 3-102.....	335 Sapphirine 391.....50c. to 1 00	140 " Chloride 114.....10c. to 5 00
Reddington Ap. 1-13.....	296 Sarcosite 317.....15c. to 1 00	141 " Chlorbromide 115.....10c. to 5 00
226 Red Antimony 189.....25c. to 2 50	231 Sard 194.....15c. to 1 00	40 " Glance 38.....25c. to 15 00
180 " Chalk 141.....5c. to 25	231 Sardonyx 195.....15c. to 1 00	140 " Horn 114.....50c. to 2 00
526 " Cobalt 555.....10c. to 5 00	Sarkinite Sm. '85.....	143 " Iodic 117.....2 50 to 10 00
172 " Copper Ore 133.....5c. to 5 00	105 Sartorite 87.....3 00	44 " Ore 41.....5c. to 1 00
180 " Hematite 140.....5c. to 5 00	398 Saspachite 447.....	117 " Red Ruby Dark 94.....25c. to 15 00
180 " Iron Ore 140.....5c. to 5 00	594 Sassolite 594.....5c. to 50	118 " " Light 96.....50c. to 10 00
612 " Lead Ore 628.....5c. to 5 00	654 Satin Spar 638.....10c. to 5 00	40 " Vitreous 38.....25c. to 15 00
180 " Ochre 141.....5c. to 25	715 " 678.....25c. to 5 00	659 A. Simonyite Ap. 1-14.....
117 " Silver Ore 91.....1 00 to 10 00	280 Saussurite 290.....50	420 A. Sinopite 477.....
176 " Zinc Ore 135.....5c. to 10 00	378 Savite 425.....50	Sipylite Ap. 3-110.....1 00 to 2 00
61 Redurthite 52.....5c. to 5 00	876 A. Scarbroite 421.....75	458 Sismondine 595.....
715 Refracting Spar, Doubly.....5c. to 10 00	299 Scapolite 319.....5c. to 5 00	307 Skolopsite 333.....
412 A. Refdanskite 893.....	614 Scheelite 605.....25c. to 2 00	84 Skutterudite 71.....
Reinite Ap. 3-102.....	772 Scheererite 727.....75	715 Slate Spar 678.....25c. to 2 00
393 A. Reissite Ap. 1-14.....75	247 C. Scheffelite 212.....25c. to 1 00	Slickensides.....25c. to 1 00
745 Remingtonite 711.....	715 Schieffler Spath 678.....25c. to 2 50	397 Sloanite 446.....
599 Resenclerite 451.....5c. to 50	412 Schiller-spar 469.....15c. to 50	551 Smalt, Naturliche 572.....5c. to 2 00
446 A. Resanite Ap. 2-48.....	112 B. Schirmerite Ap. 2-50.....1 50	83 Smaltite 70.....25c. to 1 00
282 Resin Opal 198.....10c. to 1 00	812 Schlanite 745.....	254 Smaragd 245.....50c. to 5 00
798 " Mineral 739.....50	343 Schneiderite 399.....50	217 Smaragdite 235.....15c. to 1 00
422 Restonolite Ap. 3-13.....75	320 Schörl 365.....5c. to 2 00	153 Smaragdocalcit 121.....15c. to 2 00
411 Retinalite 464.....25	334 Schorlomite 390.....10c. to 1 50	405 Smeectite 458.....25c. to 1 00
825 Retinellite 748.....25	231 Scotch Pebble 194.....5c. to 5 00	419 Smelite 473.....
810 Reussinite 741.....25c. to 50	Schraunite Ap. 3-107.....1 25	723 Smithonite 692.....15c. to 5 00
577 Rhagite Ap. 2-48.....75	74 Schreibersite 61.....75	231 Smoky Quartz 193.....5c. to 25
598 Rhodizite 596.....1 50	98 Schrift Tellur 81.....25c. to 5 00	295 A. Sharumite 316.....
448 Rhodochrome 496.....5c. to 1 00	755 Schröckerite Ap. 2-50.....	417 Soapstone 472.....5c. to 1 00
722 Rhodocerosite 691.....5c. to 3 50	376 Schröterite 421.....75	599 Soda Borate 597.....5c. to 1 00
241 Rhodonite 2 55.....5c. to 10 00	152 Schwartzembergite 120.....1 00	736 " Carbonate 705.....25c. to 5 00
448 Rhodophyllite 496.....25c. to 1 50	125 Schwartzite 101.....50c. to 5 00	138 " Muriate 112.....5c. to 2 00
324 Rhoeizite 375.....25c. to 1 00	630 Schwerspath 617.....5c. to 5 00	653 " Sulphate 636.....25c. to 5 00
716 Rhomb Spar 682.....5c. to 2 00	Schwefel, see Sulphur or Sulphide	" Sulphato-Carbonate Sm. 82.....
316 Rhyacolite 353.....25c. to 50	75 Schwefelkies 62.....25c. to 3 50	315 " Feldspar 348.....5c. to 10 00
231 Ribbon Jasper 195.....15c. to 75	808 Scleritinite 744.....	591 " Nitre 592.....5c. to 2 00
247 Richterite 231.....25c. to 1 00	379 Sclerite 428.....25c. to 2 00	307 Sodolite 330.....15c. to 1 00
125 Rionite Ap. 1-14.....	553 Scordite 574.....25c. to 1 25	138 Sodium Chloride 112.....5c. to 2 00
450 Ripidolite 497.....5c. to 3 50	276 Seorza 282.....50	831 Soft Coal 753.....5c. to 1 00
116 Rittingerite 94.....2 00	651 Selenite 638.....5c. to 2 50	492 S. Sombrerite 535.....
507 A. Rivoteite Ap. 2-48.....1 00	65 Selenmercure 56.....75c. to 2 00	274 Somervillite 280.....
811 Rochlederite 741.....	28 Selsulphur 21.....25c. to 1 00	252 Sordavallite 244.....50c. to 1 00
Rock Cork Ap. 3-94.....25c. to 1 00	163 B. Sellaite Ap. 1-14.....2 50	500 Spadaite 405.....
231 " Crystal 193.....5c. to 25 00	463 Selwynite 509.....1 50	124 Spaniolite 101.....
654 " Gypsum 638.....5c. to 1 00	329 Semelene 384.....15c. to 1 00	716 Spar Brown 681.....10c. to 1 00
715 " Milk 630.....25c. to 1 25	232 Semiopal 199.....5c. to 2 00	715 " Calc 670.....5c. to 5 00
138 " Salt 112.....10c. to 1 00	200 Semseyite Sm. '82.....	632 " Cube 621.....15c. to 1 00
419 " Soap 473.....10c. to 50	270 Senarmontite 184.....25c. to 5 00	715 " Dogtooth 670.....50c. to 5 00
682 Sermerite 675.....10c. to 2 00	767 Seneca Oil 723.....15c. to 50	715 " Doubly Refracting 5c. to 10 00
261 A. Ropperite Ap. 1-13.....25c. to 5 00	402 Sepiolite 456.....25c. to 1 00	316 " Feld 552.....5c. to 10 00
523 Reusslerite 553.....	490 A. Sericite 487.....25c. to 50	654 " Fibrous 637.....5c. to 5 00

A. E. FOOTE'S CATALOGUE OF MINERALS.

159 Spar Fluor 1.3.....5c. to 10 00	438 Stübelite 492.....	Tocornalite Ap. 2-56.....
690 " Heavy 616.....5c. to 5 00	Stuvenite A. J. S. 33-80.....	Tuluole 737.....
715 " Iceland 677.....5c. to 10 00	720 Stylopyrite 98.....1 00	86 Tombazite 72.....
241 " Manganese 223.....5c. to 2 00	685 Stypticite 656.....1 00 to 1 50	325 Topaz 376.....10c. to 5 00
715 " Nailhead 670.....10c. to 3 00	824 Succinellite 748.....	231 " False 193.....10c. to 3 00
716 " Pearl 682.....5c. to 1 50	799 Succinite 740.....5c. to 2 00	179 " Oriental 138.....2 00 to 10 00
654 " Satin 637.....10c. to 5 00	625 Sulphatite 614.....	269 E. Topazolite 269.....50c. to 1 50
412 " Schiller 469.....25	Sulphohalite A. J. S. 36-463.....1 00	804 Torbanite 742.....10c. to 5 00
257 " Tabular 210.....5c. to 5 00	22 Sulphur, Native 20.....5c. to 5 00	572 Torbernite 585.....10c. to 5 00
715 Spartaite 678.....25	23 " Selenic 21.....25c. to 1 00	474 Torrelite 515.....50
176 Spartalite 135.....5c. to 10 00	316 Sunstone 355.....10c. to 2 00	231 Touchstone 195.....10c. to 1 00
83 A. Spatiopyrite, Ap. 2-52.....1 00	638 Susannite 623.....2 00 to 10 00	320 Tourmaline 365.....5c. to 5 00
21 Spathic Iron 688.....5c. to 5 00	595 A. Sussexite Ap. 1-15, 25c. to 2 00	320 " Black 337.....5c. to 3 00
90 Spear Pyrites 75.....25c. to 1 25	584 Svanbergite 590.....1 00	320 " Blue 337.....15c. to 3 00
399 Speckstein 453.....10c. to 5 00	53 Syepoorite 47.....	320 " Brown 387.....5c. to 5 00
180 Specular Iron 140.....5c. to 5 00	58 Sylvanite 81.....25c. to 5 00	320 " Columnar 367, 15c. to 1 00
Sperryite A. J. S. 37-67.....	137 Sylvite 111.....25c. to 1 00	320 " Fibrous 367.....10c. to 5 00
239 Spessartite 268.....75	525 Symplesite 558.....	320 " Green 367.....15c. to 5 00
Sphaerocobaltite Ap. 3-111.....	Synadelphite Sm. '84.....	320 " Iron 367.....5c. to 3 00
575 Sphaerite 587.....	656 A. Syngenite Ap. 2-54, 25c. to 1 50	320 " Lithia 367.....25c. to 5 00
721 Sphaeroiderite 689.....15c. to 75	247 Syntagmatite 235, 239.....	320 " Magnesia 367, 10c. to 1 00
392 Sphaerostilbite 442.....50	Szaboite Ap. 3-118.....50	320 " Red 367.....25c. to 5 00
56 Sphalerite 48.....5c. to 5 00	595 Szaibelyite 594.....75	78 Towanite 65.....1 00
329 Sphene 383.....5c. to 5 00	Szmikite Ap. 3-118.....	316 Trachyte 359.....10c. to 50
275 Sphenoclaste 280.....	445 Tabergite 493.....	335 A. Trautwinitite Ap. 2-56.....
318 Sphurite 359.....5c. to 75	237 Tabular Spar 210.....5c. to 5 00	553 Traversellite 406.....1 00
404 A. Sphragidite 458.....1 00	148 Tachyhydrite 119.....75	715 Traverstine 680.....5c. to 1 00
184 Spinel 147.....5c. to 5 00	253 Tachylyte 245.....75	247 Tremolite 283.....5c. to 1 00
185 " Green 149.....10c. to 5 00	272 C. Tachyaphalite 275.....50	533 Trichalcite 562.....
184 " Iron 148.....10c. to 1 50	511 Tagilite 566.....1 50	Trichite 805.....
183 " Ruby 147.....10c. to 5 00	399 Tale 471.....5c. to 50	231 A. Tridymite 805.....15c. to 2 50
185 " Zinc 149.....5c. to 5 00	490 F. Talce-apatite 535.....1 00	817 A. Trinkerite Ap. 1-16.....50
Spodiosite Ap. 3-112.....	400 A. Talcooid 454.....	498 Triphylite 541.....50c. to 1 50
243 Spodumene 228.....5c. to 5 00	Talcosite Ap. 1-15.....1 00	499 Triplite 513.....15c. to 1 00
724 Sprudelstein 694.....50	153 A. Tallingite 122.....50	Triplidite Ap. 3-125, 50c. to 1 50
49 C. Staffelite 531.....25c. to 2 00	Tammite Ap. 2-55.....	232 Tripolite 199.....5c. to 50
715 Stalactite 679.....15c. to 1 50	102 Tannenite 86.....1 50	Trippkeite Ap. 3-125.....
715 Stalagmite 679.....10c. to 1 00	230 A. Tantalie Ochre 188.....	365 Tritonite 412.....2 00
815 Stankite 745.....	473 Tantalite 514.....50c. to 3 00	632 Tripe Stone 621.....50
325 Stangenstein 376.....25c. to 1 00	Tapalpyte Ap. 2-55.....	573 B. Trögerite Ap. 1-16, 1 00 to 2 50
80 Stannite 68.....25c. to 1 00	475 Tapiolite 518.....1 50	67 Troilite 57.....1 00
179 Star Sapphire 138.....50c. to 5 00	724 Tarnovicitite 694.....75	555 Trolleite 577.....75
231 " Stone 193.....25c. to 3 00	817 Tasmanite 746.....50	738 Trona 706.....25c. to 5 00
364 " " Green 412.....5c. to 5 00	662 Tauriscite 644.....75	266 Troostite 262.....10c. to 5 00
597 Stassfurtite 535.....25c. to 1 00	566 Tavistoekite 582.....	332 Tscheffkinite 387.....1 50
333 Staurolite 383.....5c. to 1 50	626 Taylorite 614.....	314 A. Tschermakite Ap. 2-57.....50
399 Steatite 411.....10c. to 50	662 A. Tectite 644.....1 00	673 Tschermakite 651.....1 00
Steeleite Ap. 3-83.....1 50 to 3 00	230 Tellurite 188.....1 50	419 Tunesite 474.....50
44 Steinmannite 41.....75	31 Telluric Bismuth 30.....50c. to 1 50	715 Tufa Calcareous 680.....5c. to 1 00
339 Stellite 396.....50c. to 1 00	58 Telluric Silver 50.....50c. to 5 00	610 Tungsate of Iron 601, 10c. to 2 50
130 Staphanite 106.....50c. to 5 00	21 Tellurium 19.....1 00 to 5 00	614 " Lime 605, 25c. to 5 00
515 Sternbergite 551.....	99 " Foliated 82, 1 00 to 5 00	616 " Lead 606, 5 c. to 5 00
63 Sternbergite 54.....1 50	98 " Graphic 81.....25c. to 5 00	225 Tungstite 186.....
Stevensite.....5c. to 1 50	746 Tengerite 710.....	202 Turgite 167.....10c. to 1 00
228 Stilbonite 188.....25c. to 1 50	127 Tennantite 104.....50c. to 1 00	497 Turnerite 510.....1 00 to 7 50
387 Stilboferite Ap. 2-53.....2 50	178 Tenorite 136.....25c. to 1 00	563 Turquois 589.....5c. to 5 00
292 Stilbite 29.....5c. to 25 00	232 Tephroite 259.....15c. to 75	438 Tyrite 524.....1 00
323 Stilbite 442.....5c. to 5 00	418 A. Teratolite 473.....50	546 Tyrolite 570.....25c. to 1 50
407 Stippomelane 460.....10c. to 1 50	404 A. Terra Sigillata 458, 10c. to 50	Tysonite Ap. 3-126.....5 00
201 Stipposiderite 170.....50c. to 1 00	735 Tessellite 416.....1 00	363 A. Uigite 412.....
630 Stinkstone 615.....5c. to 1 00	31 Tetradymite 30.....25c. to 5 00	Uinalite Sm. '85.....5c. to 1 00
407 Stolpenite 459.....1 00	125 Tetrahedrite 100.....10c. to 5 00	602 Ulexite 598.....5c. to 50
616 Stolzite 606.....50c. to 5 00	498 Tetraphyllite 541.....50	87 Ullmannite 73.....25c. to 1 00
A. Stone, Amazon Ap. 3-80, 5c. to 25 00	747 Texasite 710.....15c. to 1 50	306 Ultramarine 331.....5c. to 5 00
492 " Armenian 331, 5c. to 3 50	276 Thallite 282.....50	408 Unguwarite 461.....1 00
231 " Blood 194.....5c. to 2 00	716 Tharandite 682.....25c. to 1 00	710 Uraconite 668.....25c. to 2 00
239 " Cinnamon 266, 10c. to 2 50	Thaumasite Ap. 3-120.....	233 Uralite 222.....50
322 " Cross 371.....10c. to 2 00	629 Thernardite 615.....10c. to 5 00	278 Uralorthite 286.....2 00
715 " Gibraltar 680.....10c. to 1 00	737 Thernmonatrite 705.....1 00	573 Uranghumer 586.....10c. to 1 50
715 " Lime 678.....5c. to 25	411 C.8 Thernmophyllite 465.....1 00	190 Uraninite 154.....25c. to 2 00
715 " Lithographic 679, 5c. to 5 00	757 Thierschite 718.....	572 Uranite 585.....10c. to 5 00
231 " Lydian 195.....5c. to 1 00	169 Thomsenolite 129.....50c. to 1 50	190 Uranium Oxyd 154.....25c. to 2 00
231 " Mocha 195.....5c. to 1 50	377 Thomsenite 424.....10c. to 2 50	572, 573 " Phosphate 585, 586, 10c. to 5 00
715 " Pea 679.....15c. to 1 00	721 Thonstein 688.....5c. to 25	572 Uran Mica 585.....10c. to 1 50
654 " Plaster 637.....5c. to 1 00	366 Thorite 413.....75c. to 3 50	Uranocerite Ap. 3-127.....
715 " Pudding 679.....5c. to 25	534 Thrombolite 562.....1 00	706 Uranochalcite 667.....1 50
399 " Soap 452.....5c. to 50	280 Thulite 290.....15c. to 2 50	710 Uranochro 668.....25c. to 2 00
630 " Stink 615.....5c. to 1 00	460 Thuringite 507.....1 00	376 B. (?) Uranophane 805.....1 00
192 " Tin 157.....5c. to 5 00	65 Tiemannite 56.....75c. to 2 00	373 C. Uranospinitite Ap. 2-58.....75
247 Strahlstein 234.....10c. to 5 00	172 Tile Ore 134.....15c. to 50	Uranotil Ap. 1-16.....10c. to 5 00
335 Strakonitzite 406.....	16 Tin, Native 17.....	496 Urdite 539.....1 00
241 Stratopette 227.....1 00	192 " Oxyd 157.....5c. to 5 00	778 Urethrite 731.....
192 Stream Tin 158.....5c. to 1 25	" Pyrites 68.....25c. to 1 00	Utahite Sm. '84.....
Strengite Ap. 3-116.....25c. to 3 00	192 " Stone 157.....5c. to 2 50	445 D. Vaalite Ap. 2-58.....
454 A. Strigovite Ap. 2-53.....75	" White Cobalt 70, 25c. to 2 00	Valkite 805.....50
231 Striped Jasper 195.....5c. to 1 00	829 Titanite 383.....5c. to 5 00	316 Valencianite 355.....50c. to 5 00
62 Stromeyrite 54.....50c. to 5 00	193, 198 Titanic Acid 160, 164, 5c. to 5 00	221 Valentinite 184.....50c. to 2 50
728 Strontianite 699.....10c. to 1 50	181 Titanite Iron 143.....5c. to 2 00	621, 620 A. Vanadate of Pb, 5c. to 15 00
631 Strontia Sulphate 619.....5c. to 5 00	192 Titanomorphite Ap. 3-122.....	622 A. " of Ca. & Cu. 612
516 Struvite 551.....25c. to 1 75	Toad's Eye Tin 158.....1 00 to 3 00	623 A. " of ? 612.....
		621 Vanadinite 610.....5c. to 15 00

A. E. FOOTE'S CATALOGUE OF MINERALS.

62	B. Vanadinite Ap. 1-16.....	1 50	192	Wood Tin 157.....	15c. to	3 00	206	Limonite—Pyroxene 238 (Anomolite).....	10c. to	1 50	
49	Vanuxemite Ap. 3-128, 25c. to	5 00	704	Woodwardite 666.....	25c. to	1 50	206	" —Dufrenoy 568, 10c. to	50		
316	Variolite 359.....	1 00	617	Wulfenite 607.....	25c. to	25 00	206	" —Brennerite 718.....	25		
515	A. Variscite 582.....	2 50	101	Wulfenite 607.....	1 50 to	3 00	206	" —Siderite 721.....	25c. to	1 50	
644	Vauquelinite 630.....	3 50	70	Wurtzite 59.....	1 50	206	206	" —Henwoodite 10c. to	1 50		
411	Verd-antique 465.....	1 00	329	Xanthite 276.....	25c. to	1 50	231	Quartz—Fluorite 159.....	5c. to	2 50	
445	A. Vermiculite 493.....	5c. to	273	Xanthite 276.....	25c. to	1 50	231	" —Wollastonite 237.....	25		
64	Vermilion 56.....	10c. to	133	Xanthoconite 108.....	1 50	231	231	" —Pyroxene 238.....	5c. to	1 50	
153	Vesuvine Ap. 3-129.....	2 00	461	Xanthophyllite 508.....	1 50	231	231	" —Crocidolite 249.....	5c. to	2 00	
	Vestian 806.....		2 7	Xanthosiderite 174.....	25c. to	1 00	231	" —Datolite 327.....	2 00 to	10 00	
273	Vesuvianite 276.....	5c. to	490	Xenotime 528.....	50c. to	1 50	231	" —Barite 630.....	25c. to	1 50	
541	A. Veszylyte Ap. 2-59.....		430	Xonallite 397.....			231	" —Calcite 715.....	5c. to	2 50	
234	A. Victorite Ap. 2-18.....		790	Xylole 737.....			231	" —Dolomite 716.....	10c. to	2 00	
362	Villarsite 409.....	50c. to	805	Xyloretinite 742.....			231	" —Cornell.....	5c. to	75	
238	B. Violan 223.....	1 50	359	Xylole 406.....			231	" —Shells.....	20c. to	1 50	
	Viridite Ap. 2-59.....		205	Xylole Ochre 172.....	5c. to	25	231	" —Wood.....	5c. to	5 00	
61	Vitreous Copper 52.....	10c. to	231	" Quartz 193.....	25c. to	1 50	(?)	—Wollastonite 237.....	5c. to	2 50	
40	" Silver 38.....	25c. to	27	" Sulphuret of As. 27.....	10c. to	5 00	247	Hydrous Anthophyllite—Tremolite 347.....	5c. to	25	
669	Vitriol, Blue 648.....	25c. to	284	Yenite 296.....	15c. to	5 00	298	Muscovite—Nephelite 35c. to	50		
634	" Green 616.....	25c. to	280	A. Youstone or Yu 292.....	50c. to	2 00	293	" —Andalusite 322.....	10c. to	50	
633	" Lead 622.....	25c. to	160	Yttrocrite 125.....	75c. to	1 50	(?)	" —Titanite 329.....	50c. to	1 50	
524	Vivianite 556.....	5c. to	477	Yttrotantalite 519.....	50c. to	1 50	343	A. Leonhardtite—Calcite 35c. to	75		
709	Voglianite 668.....		331	Yttrotitanite 387.....			399	Stearite—Pyroxene 238.....	15c. to	2 00	
755	Vogite 717.....	1 00	747	Zaratite 710.....	15c. to	1 50	399	" —Epidote 276.....	5c. to	1 50	
428	Voigtite 486.....	75	372	Zeagonite 418.....			399	" —Wernerite 299.....	75		
622	Vollborthite 611.....	3 00	383	Zeele Cubic 432.....	15c. to	3 00	401	Cymatolite or Aglaite is Albite and Muscovite, pseudomorph after Spodumene.....	15c. to	1 50	
316	Volcanic Glass 359.....	5c. to	343	" Efflorescing 399.....	10c. to	1 25	410	Celadonite—Pyroxene 238.....	75		
238	Volcanite 213.....	50c. to	1 00	378	" Feather 426.....	10c. to	5 00	411	Serpentine—Enstatite 24.....	25c. to	1 50
229	Volgerite 188.....	50c. to	1 00	392	" Foliated 442.....	10c. to	5 00	411	Serpentine—Asbestos 27 (Balmorite).....	5c. to	50
675	Voltaite 652.....	50	378	" Needle 426.....	10c. to	5 00	411	Serpentine—Chrysotile 259.....	75		
57	Volzite 50.....	1 00	390	" Pyramidal 415.....	10c. to	50 00	411	" —Orthoclase 316.....	30c. to	1 00	
311	Voskite 343.....	1 00	372	" Radiated 442.....	10c. to	5 00	411	" —Calcite 715.....	100		
632	Vulpinite 621.....	50	550	A. Zepharovitchite Ap. 1-17.....	50		430	Damourite—Cyanite 324.....	1 00		
218	Wad 181.....	5c. to	572	A. Zenerite Ap. 62-1.....	00 to	3 00	452	Prochlorite—Garnet 269.....	10c. to	50	
493	Wagnerite 538.....	5 00	781	Zietrisikite 733.....			524	Vivianite—Belemnite 10c. to	1 50		
800	Walchowite 741.....	1 00		Zincaluminite Sm. '82.....			524	" —Shell.....	25c. to	1 50	
247	A. Waldheimite 242.....		14	Zinc 17.....			610	Wolframite—Scheelite 614, 25c. to	50		
573	A. Walpurgite Ap. 1-16.....	1 50	157	158 Zinc Iodid and Bromid 122			715	Calcite—Hanksite.....	25c. to	1 00	
520	C. Wapplerite Ap. 2-60.....	75	56	Zinc Blende 48.....	5c. to	5 00	715	" —Belemnite.....	10c. to	50	
701	Warringtonite 664.....	1 50	749	" Bloom 711.....	10c. to	1 00	715	" —Fossil Ivory.....	15		
606	Warwickite 600.....	15c. to	1 50	723	" Carbonate 692.....	10c. to	1 50	716	Dolomite—Calcite 715.....	15c. to	3 50
181	Washingtonite 144.....	25c. to	1 50	361	" Calamine 407.....	5c. to	5 00	722	Rhodocrosite—Same.....	2 00	
175	Water 135.....		176	" Oxide 135.....	5c. to	10 00	723	Cerussite—Galena 44.....	25c. to	2 00	
Waterville Ap. 3-131.....			361	" Silicate 407.....	5c. to	5 00	751	Malachite—Cuprite 172.....	1 00		
554	Wavellite 575.....	5c. to	50	185	" Spinel 149.....	10c. to	5 00	751	" —Azurite 752.....	10c. to	5 00
232	Wax Opal 198.....	25c. to	75	176	Zincite 135.....	5c. to	10 00	752	Azurite—Tetrahedrite 123.....	2 50	
Webkyite A. J. S. 34-72.....			750	A. Zinkazurite 713.....			752	" —Azurite 752.....	10c. to	1 50	
688	Websterite 658.....	75	106	Zinkenite 88.....	1 50 to	5 00	Hydrotitanite—Perofskite 10c. to	2 00			
33	Wehrilite 32.....	1 00	634	Zinkosite 624.....							
316	Weissigite 356.....	75	"	Zinn, see Tin.....							
426	Weissite 417.....	50	75	64	Zinnober 55.....	10c. to	5 00				
299	Wernerite 389.....	5c. to	50	75	Zinnwaldite Ap. 3-77.....	50c. to	2 50				
	Werthemanite Ap. 3-131.....		708	Zippite 667.....							
323	A. Westanite Ap. 1-16.....		272	Zircon 272.....	5c. to	10 00					
813	B. Wheelerite Ap. 2-60.....		280	Zoisite 290.....	10c. to	3 50					
119	Wheel Ore 93.....	5 00		Zonochlorite (this Catalogue)							
231	Whetstone 193.....	5c. to	46	Zorgite 43.....	1 00 to	3 00					
756	Whewellite 718.....	25	112	Zanderzerg 91.....							
221	White Antimony 184.....	25c. to	2 00	Zunyite Sm. '84.....	5c. to	1 25					
309	" Garnet 334.....	25c. to	2 00	499	Zwieselite 544.....	1 00					
729	" Lead Ore 700.....	10c. to	5 00	315	Zygadite 352.....						
90	" Pyrites 75.....	10c. to	5 00								
39	Whitneyite 37.....	5 00									
250	Wichitsite 244.....	1 50									
459	B. Wilcoxite Ap. 2-61.....	5 00									
266	Willemite 262.....	5c. to	5 00								
411	Williamsite 465.....	5c. to	1 00								
422	Wilsonite 480.....	10c. to	1 00								
526	C. Winklerite Ap. 2-61.....										
601	A. Winkworthite Ap. 1-17.....	50c. to	1 00								
490	Wiserin 528.....	1 50 to	5 00								
	Wismuth, see Bismuth.....										
276	Withamite 282.....	1 00									
726	Witherite 697.....	5c. to	5 00								
121	Wittichenite 98.....	1 00	44								
215	Wöhlerite 261.....	1 00									
492	Wolchonskoite 509.....	2 00									
92	A. Wolfachite Ap. 1-17.....	75									
610	Wolframite 601.....	10c. to	2 50								
237	Wollastonite 210.....	5c. to	5 00								
830	E. Wollongongite Ap. 1-17.....	1 00									
204	Wood Ore 169.....	10c. to	3 00								
546	" " CuArsenate 564.....	75c. to	2 50								
231	" Petrified 196.....	5c. to	5 00								
232	" —Opal 199.....	10c. to	1 00								
231	" Agatized 195.....	5c. to	5 00								
204	" Iron 169.....	5c. to	3 50								
231	" Jasperized 196.....	25c. to	5 00								
247	" Mountain 234.....	25c. to	1 00								
232	" Opalized 199.....	10c. to	1 00								
231	" Silicified 196.....	5c. to	5 00								

PARTIAL PRICE LIST OF PSEUDOMORPHS.

The first number is the species number of the first name, and the final number is that of the second name. Dash indicates "pseudomorph after." Thus, the first line is "Gold, pseudomorph after Sylvanite."

1	Gold—Sylvanite 98.....	3 50	537	Adamite 565.....	10c. to	25	526	Erythrite 558.....	10c. to	50
2	Silver—Pyrrargyrite 117.....	5 00	573	Anatite 586.....	10c. to	25	185	Gahnite 149.....	5c. to	25
4	Galena—Pyrrhomorphite 493		752	Azurite 715.....	5c. to	25	542	Herrengrundite Ap. 3-57.....	10c. to	50
61	Chalcocite—Chalcopyrite 78	1 25	30	Bismuthinite 30.....	10c. to	15	542	Laocaine 567.....	20c. to	25
61	" —Siderite 721.....	5c. to	219	Byssolite 234.....	5c. to	15	751	Malachite 713.....	5c. to	25
75	Pyrite—Fluorite 159.....	10c. to	249	Cerussite 700.....	5c. to	50	66	Millerite 56.....	10c. to	50
78	Chalcopyrite—Siderite 721.....	1 00	548	Chalcophyllite 571.....	10c. to	25	66	Mixite Ap. 3-82.....	10c. to	50
90	Marcasite—Fluorite 159.....	5c. to	560	Chilrenite 579.....	10c. to	50	536	Molybdenite 564.....	15c. to	35
179	Corundum, alterations of.....	25c. to	64	Cinnabar 55.....	10c. to	50	232	Opal, with enclosures.....	10c. to	50
180	Hematite—Fluorite 159.....	10c. to	172	Cuprite or Chalcotrichite 1143	10c. to	50	558	Pharmacosiderite 578.....	15c. to	50
180	" —Ilvaite 284.....	1 50	621	Vanadinite, red, brown, yellow and white 610.....	5c. to	50	624	Pucherite Ap. 2-12.....	15c. to	50
180	" —Siderite 721.....	25c. to	565	A. Variscite 582.....	5c. to	25	117	Pyrrargyrite 94.....	15c. to	50
188	Franklinite—Calcite 715.....	2 00	524	Vivianite 556.....	5c. to	25	493	Pyrrhomorphite, 595.....	5c. to	50
192	Cassiterite—Orthoclase 816		534	Wavellite 575.....	5c. to	25	56	Ruby Blende 94.....	5c. to	25
193	Rutile—Brookite 198.....	5c. to	517	Wulfenite 607.....	5c. to	25	231	Rutilated Quartz 194.....	15c. to	50
206	Limonite—Pyrite 75.....	5c. to					533	Scorodite 574.....	15c. to	50

MINERALS FOR THE MICROSCOPE.

PARTIAL PRICE LIST OF PSEUDOMORPHS.

The first number is the species number of the first name, and the final number is that of the second name. Dash indicates "pseudomorph after." Thus, the first line is "Gold, pseudomorph after Sylvanite."

537	Adamite	565.	10c. to	25
573	Autunite	586.	10c. to	25
752	Azurite	715.	5c. to	25
20	Bismuthinite	30.	10c. to	25
17	Byssolite	234.	5c. to	15
729	Cerussite	700.	5c. to	25
548	Chalcophyllite	571.	10c. to	50
560	Childrenite	579.	10c. to	50
64	Cinnabar	55.	10c. to	50
172	Cuprite or Chalcotrichi	613.	10c. to	50
526	Erythrite	558.	10c. to	25
185	Gahnite	149.	5c. to	25
	Herengrundite	Ap. 3-57.	10c. to	25
542	Liroconite	567.	25c. to	25
751	Malachite	715.	5c. to	25
66	Millerite	56.	10c. to	25
	Mixite	Ap. 3-82.	10c. to	25
536	Olivinite	564.	15c. to	25
232	Opal, with enclosure	198.	5c. to	50
558	Pharmacosiderite	578.	15c. to	50
624	Pucherite	Ap. 2-12.	15c. to	50
117	Pyrrgoryrite	94.	15c. to	50
493	Pyromorphite	535.	7c. to	50
56	Ruby Blende	94.	5c. to	50
231	Rutilated Quartz	194.	15c. to	50
553	Scorodite	574.	15c. to	50
22	Sulphur	20.	5c. to	50
572	Toberninite	585.	5c. to	50
621	Vanadinite red, brown, yellow and white	610.	5c. to	50
565	A. Variscite	582.	5c. to	50
524	Vivianite	556.	5c. to	25
554	Wavellite	575.	5c. to	25
617	Wulfenite	607.	5c. to	25

TO ASCERTAIN THE CHARACTERISTICS OF ANY SPECIES.—Look in the "Price List of Species and Varieties" (alphabetically arranged) for the Species No., and by this the Species can be found in its order.

TO DETERMINE ANY MINERAL.—Test the hardness with a file, or better, with the minerals in the scale of hardness. It will be found to be one of certain ones found in one of the columns of the Table of Hardness. Then, determining the color, we look in the column of this color in the Table of Color, and find that there are only a few of this hardness in this column; then, determining the crystalline form or Specific Gravity, we eliminate others, bringing it finally down to one or two, which we find in their order in the "Table of Species," and compare their qualities. Take Amethyst as an example. We easily find that its hardness is 7. It must be in the column headed $6\frac{1}{2}$ to 7 or 7-10. Its color is violet or purple, 58. We find that the only number found in columns $6\frac{1}{2}$ to 7 or 7-10, hardness, and column 58, color, is 231. It must, therefore, be a variety of Quartz. As another common mineral, take green fluor spar in cubes. Its hardness is 4, its color 4, its crystallization 1. Its Specific Gravity, $3-3\frac{1}{2}$. 159 is the only mineral combining these qualities.

The following are the abbreviations used in this table: SPECIFIC GRAVITY ranges from Water, 1, to Iridosmine, 19-21. For collections illustrating sp. gr., hardness, etc., see other pages.

HARDNESS.—1 Tale; 2 Gypsum; 3 Calcite; 4 Fluorite; 5 Apatite; 6 Feldspar; 7 Quartz; 8 Topaz; 9 Corundum; 10 Diamond.

COMPOSITION.—The following are the abbreviations of the elements: Aluminum, Al.; Antimony, Sb.; Arsenic, As.; Barium, Ba.; Beryllium, Be.; Bismuth, Bi.; Boron, Bo.; Bromine, Br.; Cadmium, Cd.; Caesium, Cs.; Calcium, Ca.; Carbon, C.; Cerium, Ce.; Chlorine, Cl.; Chromium, Cr.; Cobalt, Co.; Copper, Cu.; Didymium, D.; Erbium, Er.; Fluorine, F.; Gold, Au.; Hydrogen, H.; Indium, In.; Iodine, I.; Iridium, Ir.; Iron, Fe.; Lanthanum, La.; Lead, Pb.; Lithium, Li.; Magnesium, Mg.; Manganese, Mn.; Mercury, Hg.; Molybdenum, Mo.; Nickel, Ni.; Niobium, Nb.; Nitrogen, N.; Osmium, Os.; Oxygen, O.; Palladium, Pd.; Phosphorus, P.; Platinum, Pt.; Potassium, K.; Rhodium, Rh.; Rubidium, Rb.; Ruthenium, Ru.; Selenium, Se.; Silver, Ag.; Silicon, Si.; Sodium, Na.; Strontium, Sr.; Sulphur, S.; Tantalum, Ta.; Tellurium, Te.; Thallium, Tl.; Thorium, Th.; Tin, Sn.; Titanium, Ti.; Tungsten, W.; Uranium, U.; Vanadium, V.; Yttrium, Y.; Zinc, Zn.; Zirconium, Zr.; 9 represents the barred C or double element of Dana. Owing to a lack of proper type we have not represented the barring

of the other elements. H represents water except in the hydrocarbons.

Dots over letters indicate atoms of O.

CLEAVAGE OR FRACTURE.—A, Cubical; J, Imperfect; G, Earthy; I, Rhombohedral; B, Oct; X, Secile; C, Granular; D, Bassal; N, Dodecahedral; E, Prismatic; H, Uneven; Q, Pulverulent; F, Brittle; K, Tough; M, Hackly; P, Rhombic; L, Foliated; R, Malleable; T, Scaly; U, Fibrous; S, Compact; W, Perfect; Y, Hexagonal; Z, Conchoidal; Tr, Tabular; Rad, Radiated; Ct, Distinct; Am, Amorphous; Cry, Concretionary; V, Rectangular; Mi, Micaceous; Cld, Clinodagonal; =Equal; Res, Resinous.

FUSIBILITY.—(1) Fusible in the flame of a candle (ex.) Stibnite. (2) Fusible in the flame of a candle, in small fragments (ex.) Natrolite. (3) Infusible in the flame of a candle, but easily fusible B. B. even in somewhat large pieces (ex.) Almandine Garnet. (4) Fusible B. B. in rather fine splinters (ex.) Actinolite. (5) Fusible in finer splinters (ex.) Orthoclase. (6) B. B. becomes rounded only on the finest points and thinnest edges (ex.) Bronzite. E, Easily; V, Volatile; D, Difficulty; F, Fusible; S, Sublimed.

CRYSTALLIZATION.—I, Isometric; II, Tetragonal; III, Orthorhombic; IV, Monoclinic; V, Triclinic; VI, Hexagonal; Quartz; M, Massive; F, Fibrous; S, Stalactitic, C, Compact; A, Amorphous; G, Granular; P, Pseudo-morphous.

COLOR AND STREAK.—1 White; 2 black; 3 red; 4 green; 5 yellow; 6 blue; 7 gray; 8 brown; 9 pink; 10 copper; 11 lead; 12 steel; 13 iron; 14 tin; 15 bronze; 16 brass; 17 purple; 18 pinch-back; 19 pale; 20 velvet; 21 dark; 22 dirty; 23 colorless; 24 sulphur; 25 aurora; 26 lemon; 27 cherry; 29 cochineal; 30 pomegranate; 31 pearl; 32 hyacinth; 33 azure; 34 olive; 35 leek; 36 verdigris; 37 emerald; 38 grass; 39 pistachio; 40 sky; 41 indigo; 42 peach; 43 apple; 44 ochre; 45 honey; 46 straw; 47 ash; 48 flesh; 49 lavender; 50 raven; 51 pitch; 52 wood; 53 rose; 54 sea; 55 hair; 56 orange; 57 brick; 58 violet; 59 wax; 60 snow; 61 liver; 62 oil; 63 clove; 64 milk; 65 asparagus; 66 dull; 67 tile; 68 silver; 69 light (all colors).

LUSTRE.—70 Resinous; 71 Adamantine; 72 Vitreous; 73 Metallic; 74 Shining; 75 Bright; 76 Weak; 77 Earthy; 78 Greasy; 79 Silky; 80 Metalloidal; 81 Splendid; 82 Glassy; 83 Pearly; 84 Dull; 85 Wax; 86 Pitch. Other lustres indicated by the corresponding color number.

I think that the errors in the "Table of Species" are excusable in view of the fact that the great amount of labor in compiling and finishing it came in the Centennial summer.

(I.) Native Elements.

Species No.	SPECIES.	Page in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
1	Gold.....	3	Au.....	5	5		2.5	19.3	2-5-3	I..
1	A. Maldonite.....	Ap. 1-10	Au ² Bi.....	9, 1		A..	1.5-2	8.2-9.7	E..	I..
2	Silver.....	9	Ag.....	1	1		2.5	10.5	2-2.5	I..
3	Platinum.....	10	Pt (Ir Rh Pd Fe).....	12, 7	69, 7		4-4.5	16-19		I..
4	Platiniridium.....	11	Fe Cu Os.....	1			6-7	22.9-23		I..
5	Palladium.....	12	Pd.....	12, 7	12, 7		4.5-5	11.5		I..
6	Allopladium.....	12	Pd ³	68, 1 to 12, 7	75	D. W.	6-7	19.3-21		VI..
7	Iridosmine.....	12	Ir Os Rd Ru.....	14, 1	7		6-7	19.3-21		VI..
8	Mercury.....	13	Hg.....	1				13.5		I..
9	Amalgam.....	13	Ag Hg ² and Ag Hg ³	68, 1	7		3	13.7-21	1	I..
10	Arquerite.....	14	Ag ⁶ Hg.....	68, 1	7	R..		10.8		I..
10	A. Kongsbergite.....	Ap. 2-32	Ag ¹³ Ag.....							
11	Gold Amalgam.....	14	(Au Ag ² Hg ⁶).....	1						
12	Copper.....	14	Cu.....	10, 3	10, 3		3	8.9	3	I..
13	Iron.....	15	Fe (Ni etc.).....	13, 7		B..	4.5	7.5		I..
14	Zinc.....	17	Zn.....	1-7	1-7	D. W.	2	7		VI..
15	Lead.....	17	Pb.....	11, 7	11, 7		1.5	11.4	1	I..
16	Tin.....	17	Cu Fe Sn Zn S.....	12, 7	2		4	4.4	E..	VI..
17	Arsenic.....	17	As.....	14, 1	14, 1	C..	3.5	6	V	VI..
18	Antimony.....	18	Sb.....	14, 1	14, 1	W..	3.5	6.2	1	VI..
19	Alloantimony.....	18	Sb As ₂	14, 1, 3, 7	73, 66, 81		3.5	61.3	E..	VI..
20	Bismuth.....	19	Bi.....	3, 1		D..	2.5	9.7	1	VI..
21	Tellurium.....	19	Te.....	14, 1	14, 1	Y..	2-2.5	6.2	1	VI..
22	Native Sulphur.....	20	S.....	24, 5	70	Z..	1.5-2.5	2	E..	III..
23	Selen Sulphur.....	21	Se.....	8 or 56	70	Z..	1.5-2.5	2	E..	M..
24	Diamond.....	21	C.....	1	71	B..	10	3.5-3.6		I..
25	Graphite.....	24	C.....	13, 2	2	L..	21.5	2		VI..

(II.) Sulphids, Tellurids, Selenids, Arsenids, Antimonids, Bismuthids.

Species No.	SPECIES.	Page in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
24	Realgar.....	26	As S ₂	25, 3.	70.	Z.	1.5-2.	3.5.	E.	IV.
25	Orpiment.....	27	As S ₂	26, 5.	31.	L.	1.5-2.	3.48.	E.	III.
26	Dimorphite.....	28	As S ₂	56, 5.	71, 81.		1.5.	3.58.	E.	III.
27	Stibnite.....	29	Sb ⁴ S ₃	11 to 12, 7.	11, 7.	D.	2.	4.5.	1.	III.
28	A. Livingstonite.....	Ap. 2-35		75, 7.	3.		2.	4.81.		
29	Bismuthinite.....	30	Bi S ₂	11, 7.	E.		2.		1.	III.
30	Tetradymite.....	30	Bi Te ³ or Bi (Te S Se) ³	12, 7.	2.	D.	1.5-2.	7.5.	E.	VI.
31	Joseite.....	31	Bi Te S Se.....	2, 7.		D.	1.5-2.	7.9.	E.	VI.
32	Wehrliite.....	32	Bi (Te S) with Te.....	12, 7.	75.	D. W.	1-2.	8.44.		VI.
33	A. Arsenotellurite.....	Ap. 2-5.	2 Te S ₂ As ₂ S ₃	8.						
34	Molybdenite.....	32	Mo S ₂	6, 7.	4.	L.	1-1.5.	4.6.		IV?
35	Dyscrasite.....	35	Ag ³ Sb.....	68, 1.	68, 1.	D.	3.5-4.	9.6.	1.5.	III.
36	Chilonite.....	36	Ag ⁶ Bi.....	68, 1.		C.	soft.			A.
37	Domeykite.....	36	Cu ⁶ As.....	14, 1.	2.	F.	3.5.	7.5.	E.	M.
38	Algodonite.....	37	Cu ¹² As.....	12, 7.	15.	K.	4.	7.6.	E.	M.
39	Whitneyite.....	37	Cu ¹⁸ As.....	15.	15.	M.	3.5.	8.3.	E.	M.
40	Argentite.....	38	Ag S.....	7, 2.	7, 2.	R.	2.5.	7.2.	1.5.	I.
41	C. Polyargyrite.....	Ap. 1-12	12 Ag S + Sb ² S ₃	13, 2 to 7, 2.	7, 3.	A.	soft.			I.
42	Naumanite.....	39	Ag Pb Se.....	13, 2.	2.	A.	2.5.	8.	E.	I.
43	Eucairite.....	39	(Cu Ag) Se.....	11, 7.	74.	C.			E.	M.
44	Crookesite.....	40	(Cu Ti Ag) Se.....	11, 7.			2.5.	6.9.	E.	M.
45	Galenite.....	40	Pb S.....	11, 7.	7.	A.	2.5.	7.5.	1.	I.
46	A. Huascolite.....	44	Pb S.....	11, 7.						
47	B. Cuproplumbite.....	44	Pb S.....	11, 7.						
48	Clausthalite.....	42	Pb Se.....	11, 7.	7, 2.	A.	2.5.	7-8.		I.
49	Zorgite.....	43	(Pb Cu) Se.....	11, 7.	21, 7.	C.	2.5.	7.5.	E.	M.
50	Lehrbachite.....	44	Pb Hg Se.....	11, 7.	2.	C.	2.	7.8.	V.	M.
51	Altaite.....	44	Pb Te.....	14, 1.			2.	8.	E.	I.
52	Bornite.....	44	(Cu Fe) S.....	10, 3, 5, 17.	2.		3.	5.5.	E.	I.
53	Bozolanite.....	46	Cu Se.....	68, 1.	74.		soft.			M.
54	Castillite.....	46	Cu Pb Fe Ag Zn S.....	10, 3.	2.	L.	3.	5.2.	E.	M.
55	Alabandite.....	46	Mn S.....	13, 2.	4.	A.	3.5.	4.	3.	I.
56	Syppoorite.....	47	Co S.....	12, 7.				5.45.		
57	Pentlandite.....	47	Ni Fe S.....	15, 6.	8.	B.	3.5-4.	4.6.	E.	I.
58	Grünauite.....	47	Bi Ni Cu Fe S.....	12, 7.	21, 7.	B.	4.5.	5.1.	E.	I.
59	Sphalerite.....	48	(Zn Fe) S.....	1, 5, 4, 2, 8.	70.	N.	3.5-4.	3.9-4.2.		I.
60	A. Oldhamite.....	Ap. 2-42		19, 8.				2.8.		I.
61	Voltzite.....	50	4 Zn S + Zn O.....	21, 3, 5, 8.	72 to 78.		4-4.5.	3.66-3.81.		
62	Hessite.....	50	Ag Te.....	11, 7.	7.	X.	2.5-3.	8.5.		
63	A. Petzite.....	51	Au Te + 3 Ag Te.....	13, 2.	13, 2.		2.5.		E.	IV.
64	Daleminzite.....	51	Ag S.....	13, 2.	7, 2.	R.	2-2.5.	7.04.		I?
65	Acanthite.....	51	Ag S.....	13, 2.	13, 2.	R.	2.5.	7.2.	1.5.	III.
66	Chalcocite.....	52	Cu S.....	12, 7.	7.	Z.	2.5-3.	5.7.	E.	III.
67	Stromeyerite.....	54	(Cu Ag) S.....	12, 7.	7.		2.5-3.	6.3.	E.	III.
68	Sternbergite.....	54	Ag Fe S.....	18, 8.	2.	D.	1-1.5.	4.2.	E.	III.
69	Cinnabar.....	55	Hg S.....	3.	3.	W.	2.5.	8.9.	V.	V.
70	A. Metacinnabarite.....	Ap. 1-10	Hg S.....	7, 2.	73, 2.	H.	3.	7.70-7.748.		A.
71	Tiemannite.....	56	Hg Se.....	11, 7.	2.	C.	2.5.	7.2.	E.	VI.
72	A. Onofrite.....	56	Hg Se + 1 Hg S.....	7, 11, 21.	74.					A.
73	Millerite.....	56	Ni S.....	15, 5.	75.		3-3.5.	5.6.	E.	VI.
74	A. Beyrichite.....	Ap. 1-3.	3 Ni S + 2 Ni S ₂	11, 7.	73.	W.	3-3.5.	4.7.		VI?
75	Troilite.....	57	Fe S (or Fe ³ S ₂).....	8.	2.		4.0.	4.75.	E.	M.
76	Pyrrhotite.....	58	6 Fe S + Fe S ₂	15, 5.	2, 7.	D.	4.	4.5.	E.	VI.
77	A. Chalcopyrrhotite.....	Ap. 2-11	Cu ⁴ Cu S ⁶	8.				4.28.		M.
78	Greenockite.....	59	Cd S.....	56 to 45, 5.	71.	E.	3-3.5.	4.9.		VI.
79	Wurtzite.....	59	Zn S.....	8, 2.	72, 8.	V. P.	3.5-4.	3.98.		VI.
80	Niccolite.....	60	Ni ² As.....	10, 3.	8, 2.	H.	5-5.5.	7.4.	E.	VI.
81	A. Arsenical Cobalt.....	Ap. 1-1.	Co As.....							
82	Breithauptite.....	61	Ni ² Sb.....	10, 3.	3, 8.		5.5.	7.5.	3.	VI.
83	A. Arite.....	Ap. 2-5.	As Sb.....				5.5.	7.5.	F.	M.
84	Kaneite.....	61	Mn As.....	7, 1.	73.	L. or C.	5?	5.55.		A.
85	Schreibersite.....	61	P Fe Ni C.....	12, 7.			6.5.	7.01-7.22.		
86	Pyrite.....	62	Fe S ₂	16, 5.	8, 2.		6-6.5.	4.9.	E.	I.
87	Hauerite.....	64	Mn S ₂	8, 2.	8, 3.	A.	4.	3.46.	3.	I.
88	Cubanite.....	65	Cu S + Fe S + 3 Fe S ₂	15, 5.	3, 15.	A.	4.	4.1.	E.	I.
89	Chalcopyrite.....	65	Cu S + Fe S + Fe S ₂	16, 5.	4, 2.	H.	3.5.	4.3.	2.	II.
90	Barnhardtite.....	67	2 Cu S + Fe S + Fe S ₂	15, 5.	7, 2.		3.5.	4.5.	E.	M.
91	Stannite.....	68	Cu Fe Sn Zn S.....	12, 7.	2.		4.	4.4.	E.	M.
92	Linnéite.....	68	2 (Co Ni) S + Co S ₂	12, 7.	2, 7.		3.5.	4.9.	E.	I.
93	A. Horbachite.....	Ap. 2-28	4 Fe S ₂ + Ni S ₃	18, 8 to 12, 7.	2.	J.	4.5.	4.43.		M.
94	Carrollite.....	69	2 (Cu Co) S + Co S ₂	14, 1.	7.		5.5.	4.85.	E.	I.
95	Smaltite.....	70	(Co Fe Ni) As.....	14, 1.	7, 2.	B.	5.5.	6.4-7.2.	E.	I.
96	A. Spathiopyrite.....	Ap. 2-52	Co Fe Cu As S.....	14, 1.			4.5.	6.7.		III.
97	Skutterudite.....	71	Co ² As ³	7, 1.		B.	6.	6.7.	E.	I.
98	Cobaltite.....	71	Co S ₂ + Co As.....	1, 3.	7, 2.	B.	5.5.	6.6.	E.	I.
99	Gersdorffite.....	72	Ni S ₂ + Ni As ₃	1, 7.	7, 2.		5.5.	5.6-6.9.	E.	I.
100	Ullmannite.....	73	Ni S ₂ + Ni Sb.....	12, 7.			5.5.	6.3.	3.	I.
101	Corynite.....	74	Ni S ₂ + Ni (As Sb).....	7, 1.	2.	H.	4.5-5.	6.	E.	I.
102	Laurite.....	74	12 Ru ² S ³ + Os S ₂	21, 13, 2.	75, 73.	ct. B.	7 +.	6.99.		I.

Species No.	SPECIES.	Page in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
90	Marcasite.....	75...	Fe S ₂	19, 5 to 1	2, 7		6-6.5	4.7	E.	III.
91	Leucopyrite.....	76...	Fe As.....	68, 1	7, 2		5.5	6.8-8.7	D.	III.
92	Rammelsbergite.....	77...	Ni As ₂	7, 1	7-2		5.5	7	E.	III.
92	A. Wolfachite.....	Ap. 1-17	Ni S ₂ +Ni (As Sb) ₂	68, 1	2	73	5.5	6.372	III.	III.
93	Lölingite.....	77...	Fe As S.....	68, 1	7, 2		5.5	6.8-8.7	D.	III.
93	A. Glauconopyrite.....	Ap. 1-6	S As Sb Fe Co Cu.....	1, 7 to 14, 1	7, 3		4.5	7.181	III.	III.
94	Arsenopyrite.....	78...	Fe S ₂ +Fe As.....	68, 1	7, 2	H	5.5	6.2	2	III.
95	Glauconot.....	80...	(Co Fe) S ₂ +(Co Fe) As.....	7, 1	2	P	5	6	E.	III.
96	Pacite.....	81...	Fe ²⁺ +4 Fe As ²	14, 1	73, 2		4-4.5	6.297	III.	III.
97	Alloclasite.....	81...	2 Co S ₂ +Co As+4 Bi As.....	12, 7	2	P	4.5	6.6	E.	III.
98	Sylvanite.....	81...	(Ag Au) Te ³	12, 7			2	8	E.	IV.
98	A. Calaverite.....	795...	Au Te ₄	15, 5	5, 7	F. H.			M.	M.
99	Nagyagite.....	82...	Pb Au Te S.....	2, 7	7	D-L	1-1.5	7	E.	II.
100	Covellite.....	83...	Cu S.....	41, 6 to 2		D	1.5-2	4.6	VI.	VI.
100	A. Melonite.....	801...	Ni ₂ Te ₃	3, 1	73, 21, 7	D. Y.				
101	Chalcocite.....	85...	Cu S+2 Sb S ₂	11, 7	2	E	3.5	4.8	I.	III.
102	Emplectite.....	86...	Cu S+Bi S ₂	14, 1	2	E			E.	III.
103	Chiviatite.....	86...	2 (Cu Pb) S+3 Bi S ₂	11, 7			6.92	1	M.	M.
104	Berthierite.....	86...	Fe S+2 Sb S ₂	12, 7			2-3	4.2	1.5	
105	Sartorite.....	87...	Pb S+As S ₂	11, 7	8	D	3	5.3	E.	III.
106	Zinkenite.....	88...	Pb S+Sb S ₂	11, 7			3-3.5	5.3	I.	III.
107	Jordanite.....	88...	Pb As S.....	11, 7	2	E			E.	III.
108	Miargyrite.....	88...	Ag S+Sb S ₂	13, 2	27, 3		2.5	5.2	1	IV.
109	Plagionite.....	89...	Pb S Sb.....	11, 7			2.5	5.4	1	IV.
110	Binnite.....	90...	3 Cu S+As S ₂	12, 7	27, 3	F	4.5	4.4	E.	III.
111	Brongniartite.....	90...	2 (Pb Ag) S+Sb S ₂	2, 7		D	3	5.9	E.	III.
112	Jamesonite.....	90...	2 Pb S+Sb S ₂	11, 7		D	2-3	5.6	1	III.
112	A. Cosalite.....	797...	2 Pb S+Bi S ₂	11, 7	73	H			E.	III.
113	Dufrenoyite.....	92...	2 Pb S+As S ₂	11, 7	8	D	3	5.3	E.	III.
113	A. Diaphorite.....	Ap. 1-4	S Sb Pb+Ag.....	12, 7	73	H	2-3	5.902		
114	Freieslebenite.....	93...	5 (Pb Ag) S+2 Sb S ₂	12, 7	7	E	2-2.5	6-6.4	E.	IV.
115	Pyrostilpnite.....	93...	S Sb Ag.....	32, 3	31, 71	X		4.2-4.25	1	IV.
116	Rittingerite.....	94...	S Sb Ag?.....	56, 5	71, 73	F	1.5-5		E.	IV.
117	Pyrrargyrite.....	94...	3 Ag S+Sb S ₂	21, 3 to 2	71	Z	2.5	5.8	1	VI.
118	Proustite.....	96...	3 Ag S+As S ₂	29, 3	71	Z	2.5	5.5	1	VI.
119	Bournonite.....	96...	3 (Cu Pb) S+Sb S ₂	12, 7	13, 3	Z	2.5	5.8	1	III.
120	Stylopyrite.....	98...	3 (Cu Fe Ag) S+Sb S ₂	13, 2	13, 2		3	4.7	1	III.
121	Wittichenite.....	98...	3 Cu S+Bi S ₂	12, 7	2		3.5	4.6-6	E.	III.
121	A. Klaprotholite.....	Ap. 1-8	3 Cu S+Bi S ₂ S ₂	12, 7 to 5	73, 2	ct. C	2.5	4.6		
122	Boulangerite.....	99...	3 Pb S+Sb S ₂	11, 7			2.5-3	5.9	1	M.
122	A. Epiboulangerite.....	Ap. 1-5	S Sb Pb.....	21, 67	73		6.309		III.	III.
122	B. Schirmerite.....	Ap. 2-50	Pb Ag Bi S.....	11, 71 to 2	73	H. F.	soft		E.	M.
123	Kobellite.....	99...	3 Pb S+(Bi Sb) S ₂	11, 7			soft	6.3	1	Rad
124	Aikinite.....	100...	3 (Cu Pb) S+Bi S ₂	11, 7			2-2.5	67	1	III.
126	Tetrahedrite.....	100...	4 (Cu S)+Lb S ₂	11, 7			3.5	4.5-5.1	1.5	I.
126	Polytellurite.....	104...	S Sb Pb Ag Fe.....					5.483		
127	Tennantite.....	104...	4 (Cu Fe) S+As S ₂	13, 2	7		3.5-4	4.5	1.5	I.
127	A. Julianite.....	Ap. 1-8	S As Cu Sb.....	21, 3, 11	73, 71	F	soft	5.12	E.	
128	Menghinite.....	105...	4 Pb S Sb S ₂	11, 7			2.5	6.3	1	IV.
129	Geocronite.....	105...	5 Pb S+(Sb As) S ₂	11, 7		C	2-3	6.5	1	III.
130	Stephanite.....	106...	5 Ag S+Sb S ₂	13, 2	2		2.5	6.26	1	III.
131	Polybasite.....	107...	9 (Ag Cu) S+(Sb) As S ₂	13, 2	13, 2	H	2.3	6.25	E.	III.
132	Enargite.....	107...	3 Cu S+As ₂ S ₂	7, 8, to 13, 2	73, 7	F. H	3	4.43-4.45	E.	III.
132	A. Epigenite.....	Ap. 1-5	Cu Fe As S.....	12, 7	2	C	3.5		E.	III.
132	B. Famatinite.....	Ap. 2-20	{ 3 Cu ₂ S Sb ₂ S ₂ + } 3 Cu ₂ S As ₂ S ₂	10, 3, 7	2	H. F.	3.5	4.57	E.	M.
133	Xanthoconite.....	108...	Ag As S.....	30-5	71		2	5-1	E.	VI.
134	Clayite.....	108...	S As Sb Pb Cu.....	2, 11, 7	73, 2, 11, 7	X	2.5		E.	I.
135	Bolivianite.....	109...	S Ag Sb.....	11, 7	sub, 73	ct.	2.5	4.820		III.

(III.) Compounds of Chlorine, Bromine, Iodine.

136	Calomel.....	111...	Hg ₂ Cl.....	7-1	71		1.5	6.5	V.	II.
137	Sylvite.....	111...	K Cl.....	23 to 1	72	A	2	1.9-2	E.	III.
138	Halite.....	112...	Na Cl.....	23, 1, 3	72	A	2.5	2.15	E.	I.
138	A. Chlorocalcite.....	Ap. 2-11	Ca Cl ₂ +K Na Mn.....							
139	Sat Ammoniac.....	114...	N H ₄ Cl.....	1, 5	72		1.5-2	1.53	7	I.
140	Cerargyrite.....	114...	Ag Cl.....	31, 7	70, 71		1-1.5	5.5	1	I.
141	Embolite.....	115...	Ag (Cl Br).....	4 to 21, 5	71		1-1.5	5.3-5.8	1	I.
142	Bromyrite.....	116...	Ag Br.....	4-5	71		2-3	5.8-6	1	I.
143	Iodyrite.....	117...	Ag I.....	26, 5	71	D	1.5	5.7	1	VI.
144	Coccinite.....	117...	Hg I?.....	3 to 5	71				S.	M.
144	A. Borsosite.....	Ap. 2-8	Ag Cl+Hg ₂ Cl.....	5 to 8						
145	Cotunnite.....	117...	Pb Cl.....	5-1	71		2	5.2	E.	III.
146	Molybite.....	118...	Fe ² Cl ³	8, 3, 5					E.	M.
146	A. Nantokite.....	Ap. 1-11	Cu ₂ Cl.....	1						
147	Carnallite.....	118...	K Cl+2Mg Cl+12 H.....	64, 1	74, 78	Z			E.	M.
148	Tachyhydrite.....	119...	(Ca Mg) Cl+4 H.....	5		2 ct.			E.	M.

Species No.	SPECIES.	Page in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystalization.
148	A. Erythrosiderite.....	Ap. 2-19	2 K Cl + Fe ₂ Cl ₃ + 2 H.....	3.....	.....	.....	.....	.....	S.....	III.....
149	Kremersite.....	119...	KCl + AmCl + Fe ² Cl ³ + 3H.....	3.....	.....	.....	soft.....	.....	S.....	I.....
150	Matlockite.....	119...	Pb Cl + Pb.....	4 to 5, 1.....	31.....	D. J.....	3.....	7.2.....	E.....	II.....
151	Mendipite.....	120...	Pb Cl + 2 Pb.....	23-1.....	31.....	E.....	2.5.....	7-7.1.....	E.....	III.....
152	Schwartzembergite.....	120...	Pb I + 2 Pb O.....	46, 5.....	71.....	F.....	2-2.5.....	5.7.....	E.....	VI.....
153	Atacamite.....	121...	3 Cu H + Cu Cl H.....	35, 2, 37-4.....	72.....	E.....	3.5.....	4.25.....	F.....	III.....
154	A. Tallingite.....	122...	4 Cu H + Cu Cl H.....	6-4.....	.....	.....	3.....	3.5 (?).....	F.....	M.....
154	Percyite.....	122...	Pb Cu Cl O H.....	40-6.....	.....	.....	2.5.....	.....	.....	I.....
155	Chloride of Magnesia.....	123...	Mg Cl.....	1-2.....	.....	.....	.....	.....	.....	.....
156	Chloride of Manganese.....	123...	Mn Cl ₂	1-2.....	.....	D. W.....	.....	.....	.....	.....
157	Iodid of Zinc.....	123...	Zn I ₂.....	.....	.....	.....	.....	.....	.....	.....
158	Bromid of Zinc.....	123...	Zn Br.....	.....	.....	.....	.....	.....	.....	.....

(IV.) Fluorine Compounds.

159	Fluorite.....	123...	Ca Fl.....	.....	72.....	B.....	4.....	3.18.....	3.....	I.....
160	Yttrocerite.....	123...	(Ca Ce Y) Fl.....	1-7-6.....	19, 72.....	.....	4.5.....	3.45.....	.....	M.....
161	Fluocerite.....	126...	Ca Fl + Ce ² Fl ³	5-67-3.....	76.....	.....	4.5.....	4.7.....	.....	VI.....
162	Fluocerine.....	126...	Ce ² Fl ³ + 3 (Ce O ³ + H).....	5, 3.....	72 or 70, 5.....	.....	4.5-5.....	.....	.....	I.....
163	Fluellite.....	126...	Al Fl.....	1.....	72.....	.....	.....	.....	.....	III.....
163	A. Ralstonite.....	Ap. 1-13	Al Ca Mg Fl H.....	23, 1.....	72.....	.....	4.5.....	2.5.....	.....	I.....
163	B. Sellaite.....	Ap. 1-14	Mg Fl.....	23.....	72.....	W. Z.....	5.....	2.972.....	.....	II.....
164	Cryolite.....	126...	3 Na Fl + Al ² Fl ³	1-2.....	72.....	D. W.....	2.5.....	3.....	.....	III?
165	Arksutite.....	128...	2 (Ca Na) Fl + Al ₂ Fl ³	1.....	72.....	.....	2.5.....	3.1.....	E.....	M.....
166	Chiolite.....	128...	3 Na Fl + 2 Al ² Fl ³	60-1.....	.....	.....	4.....	2.72.....	.....	II.....
167	Chodoneffite.....	128...	2 Na Fl + Al ² Fl ³	1.....	72.....	.....	4.....	3.....	E.....	II.....
168	Pachnolite.....	129...	3 (Ca Na) Fl + Al ² Fl ³ + 2 H.....	23-1.....	72.....	.....	2.5-4.....	2.75.....	.....	IV.....
169	Thomsenolite.....	129...	2 (Ca Na) Fl + Al ² Fl ³ + 2 H.....	1, 3.....	72, 31.....	D. W.....	2.5-4.....	2.74.....	E.....	IV.....
169	A. Hagemannite.....	130...	F Si Al Fe Mg Ca Na.....	44, 5.....	74.....	.....	3-3.5.....	2.59.....	E.....	.....
170	Gearksnitite.....	130...	2 Ca Fl + Al ² Fl ³ + 4 H.....	1.....	22.....	.....	2.....	.....	E.....	.....
171	Prosopite.....	130...	Si F Al Ca H.....	23, 1, 7.....	.....	.....	4.5.....	2.890.....	.....	IV.....

(V.) Oxygen Compounds.

172	Cuprite.....	133...	Cu O.....	29-3.....	77, 71.....	B.....	3.5-4.....	6.....	E.....	I.....
173	Periclaseite.....	134...	Mg Fe.....	7 to 21, 4.....	.....	.....	6.....	3.674.....	.....	I.....
174	Bansenite.....	134...	Ni O.....	39, 4.....	72, 8, 2.....	.....	5.5.....	6.398.....	.....	I.....
175	Water.....	135...	H ₂ O.....	23.....	.....	.....	.....	0.915.....	.....	VI.....
176	Zincite.....	135...	Zn O.....	56, 5, 3.....	sub. 71.....	D. C. F.....	4-4.5.....	5.43-5.7.....	.....	VI.....
177	Massicot.....	136...	Pb O.....	5.....	86.....	.....	2.....	8.....	.....	III.....
178	Melaconite.....	136...	Cu O.....	2 to 8, 2.....	73 to 77.....	.....	2.5.....	5.95.....	D.....	I.....
178	A. Delafossite.....	Ap. 2-16	Cu O Fe O ₃ Al O ₃	21, 7.....	2, 7, 73.....	.....	.....	5.07.....	.....	VI.....
179	Corundum.....	137...	Al O ₃	1, 7, 6 & -.....	72.....	.....	.....	4.....	.....	VI.....
180	Hematite.....	140...	Fe O ₃	12, 7 to 2.....	3.....	T. U. S.....	5.5-6.5.....	5.....	.....	VI.....
180	A. Martite.....	142...	Fe O ₃	13, 2.....	sub. 73.....	.....	6-7.....	4.809.....	.....	VI.....
181	Menaccanite.....	143...	(Ti Fe ₂) O ₃	2.....	2.....	.....	5-6.....	.....	.....	VI.....
181	A. Iserite.....	145...	Fe O Ti O ₃ + Fe O ₃.....	.....	.....	.....	.....	4.817.....	.....	I.....
182	Perofskite.....	146...	Ca O Ti O ₃	13, 2 to 5.....	7.....	.....	5.5.....	4.03.....	.....	I.....
183	Spinel.....	147...	(Mg O Fe O) (Al O ₃ Fe O ₃).....	2, 6, 8, 5, 4 & 2.....	72.....	Z.....	8.....	3.5-4.1.....	.....	I.....
184	Hercynite.....	148...	Fe O Al O ₃	2.....	72, 4.....	72, 4.....	7.5-8.....	3.91.....	.....	I.....
185	Gahnite.....	149...	(Zn O Mg O) (Al O ₃ Fe O ₃).....	4-2.....	7, 92, 78.....	.....	7.5-8.....	4-4.5.....	.....	I.....
185	A. Dimagnetite.....	151...	Fe O Fe O ₃.....	.....	.....	.....	.....	.....	.....	.....
186	Magnetite.....	149...	Fe O Fe O ₃	13-2.....	2.....	B.....	5.5-6.5.....	4.9-5.2.....	.....	I.....
187	Magnesioferrite.....	152...	Mg O Fe O ₃	2.....	2.....	.....	6-6.5.....	4.5-4.6.....	.....	I.....
188	Franklinite.....	152...	(Zn, Mn, Fe) (Mn Fe).....	13-2.....	3, 8.....	.....	5.5-6.5.....	5.1.....	.....	I.....
188	A. Jacobsite.....	Ap. 1-8	(Mn Mg) (Mn, Fe).....	2.....	2, 8.....	.....	6.....	4.75.....	.....	I.....
189	Chromite.....	153...	Fe O Cr O ₃	13-2.....	8.....	H.....	5.5.....	4.3.....	.....	I.....
190	Uraninite.....	154...	U O U O ₃	8-2.....	8.....	Z. H.....	5.5.....	6.4-7.....	.....	I.....
191	Chrysoberyl.....	155...	Be ³ O Al O ₃	65 to 67, 4.....	72.....	.....	8.....	5.7.....	.....	III.....
192	Cassiterite.....	157...	Su O.....	8-2.....	71 and 66.....	.....	6-7.....	6.4-7.1.....	.....	II.....
193	Rutile.....	159...	Ti O ₂	3, 8, 5, 2.....	71.....	E.....	6.5.....	4.2.....	.....	II.....
194	Octahedrite.....	161...	Ti O ₂	6, 8, 3, 2.....	71.....	B.....	5.5.....	3.8-3.9.....	.....	II.....
195	Hausmannite.....	162...	Mn ² O Mn O ₂	8-2.....	3.....	D.....	5-5.5.....	4.7.....	.....	II.....
196	Braunite.....	163...	2 Mn ² O Mn O ₂ + Mn O ₂ Si O ₂	8-2.....	2.....	.....	6-6.5.....	4.7.....	.....	II.....
197	Minium.....	163...	Pb ³ O ₄	3.....	66.....	.....	2-3.....	.....	.....	I.....
198	Brookite.....	164...	Ti O ₃	5, 3, 8, 2.....	71.....	.....	5.5-6.....	4.2.....	.....	III.....

Species No.	SPECIES.	Page in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
198	A. Enmanite	165.								
199	Pyrocluseite	165.	Mn O ₃	13-2	2		2-5	4.82	III.	
200	Crednerite	166.	Cu ² O Mn ² O ₃	2	2	D.	4.5	5	IV.	
201	Plattnerite	167	Pb O ₂	13-2	8			9.3		M.
201	A. Vanadic ochre	167								C.
202	Turgite	167	Fe ² O ₃ H.	3-2	3	U. S.	5-6	4.14	III.	
203	Diaspore	168.	Al O ₃ H.	1, 7, 8, 6, 4	72, 31.		6.5-7	3.4	III.	
204	Güthite	169.	Fe ³ O ₃ H.	21-3, 8, 2.	sub. 73	E.	5-5.5	4.3	III.	
205	Manganite	170.	Mn O ₃ H.	12-7	3, 8	E.	4	4.3	III.	
206	Limonite	172.	Fe ² O ₃ H.	8	5	U. S. G.	5-5.5	3.6-4	S.	
207	Xanthosiderite	174.	Fe O ₃ H ₂	8, 3	78 or 79		2.5			
208	Beauxite	174.	(Al O ₃ , Fe O ₃) H ₂	1, 8, 3	60			2.55		A M
209	Eliasite	175.	R O ₃ H ₂	3, 8	78, 70, 65	78, 73	3.5-4.5	4-5	VI.	
210	Brucite	175.	Mg O H.	1, 7, 4	31	D.	2.5	2.35	VI.	
211	Pyrochroite	177.	(Mn O Mg O) H.	1 to 15	31	D.	2.5		VI.	
212	Gibbsite	177.	Al O ₃ H ₂ O ₃	1-5-3	66		2.5-3	2.3	VI.	
213	Limonite	178.	Fe O ₃ H ₂	8	5	U. S. G.	5-5.5	3.6-4	M.	
214	Hydrotalcite	178.	Al O ₃ , Mg O, H	1	31	D.	2	2.04	VI.	
214	A. Namaqualite	Ap. 1-11		19, 6	79		2.5	2.49		VI.
215	Pyroanrite	179.	Fe O H ₃ + 6 Mg O H + 6 H	5						
216	Gummite	179.	(U O ₃ , Fe O ₃) H ₃	5 to 3	78, 5		2.5-3	3.9-4.20	A.	
217	Psilomelane	180.	Mn O ₃ , Ba O ₃ H.	2	2, 8		5-6	3.7-4.7	M.	
218	Wad	180.	Mn O ₃ H.	7, 66, 2	66					
218	A. Heterogenite	Ap. 2-27	O, Co, Cu, Fe, Bi, Al, Ca.	2, 3, 8			3	D.	A.	
218	B Wad (Asbolite)	181.	Mn O ₃ , Co O, H.	2	66		2-2.5	3.1-3.3		
218	D. Lithiophorite	Ar. -9	(Mn O ₃ , Al O ₃ , Fe O, Co O) (Cu O, Ba O, Li O, H.)	6, 2	66		3	3.2-3.6		
218	E. Rabdionite	Ap. 1-13	Mn, Co, Fe, Cu, O.	2	73, 78		1	2.8	3	S.
219	Arsenolite	183.	As O ₃	1	79		1.5	3.69	V, S.	I.
220	Senarmonite	184.	Sb O ₃	1	71	B.	2-2.5	5.22	V, S.	I.
221	Valentinite	184.	Sb O ₃	1	71	E.	2.5-3	5.56	V, S.	III.
221	A. Claudetite	196.	As O ₃	1	31	E.	2.5	3.8		III.
222	Bismite	185.	Bi O ₃	4, 5, 7, 1	71, 77, 66			4.3611	1	M.
223	Karelinite	185.	Bi O ₃ with Bi S.	11, 7	73	ct.	2	6.69	1	M.
224	Molybdate	185.	Mo O ₃	24, 56, 5	79, 77		1-2	4.5	1	III.
224	A. Ilsemanite	Ap. 1-7	Mo O ₂ + 4 Mo O ₃	6, 2						
225	Tungstite	186.	W O ₃	5	66					
225	A. Meymacite	Ap. 2-38	W O ₂ 2 H.	5, 4, 5	24, 5			3.80		
226	Kermesite	186.	Sb O ₃ + 2 Sb S ₃	27-3	61	D.	1.5	4.5	1.8	IV.
227	Cervantite	187.	Sb O ₃ , Sb O ₅	5	60		2	3.2-3.6		III.
228	Stibiconite	188.	Sb O ₄ + H.	5-3 to 1	31		4-5.5	5.28		M.
229	Volgerite	188.	Sb O ₃ + 5 H.	1	66	Q.		6.6		M.
230	Tellurite	188.	Te O ₃	1-5						
230	A. Tantalite Ochre	188.	Ta.	8	72					
231	— Quartz.	189.	Si O ₂	{ 23, 1, 66 } { 5, 3, — }	72	Z.	7	2.6		VI.
231	A. Tridymite	805.	Si O ₂					2.2-2.3		VI.
231	B. Asmanite	Ap. 2-5	Si O ₂			F.	5.5	2.245		III.
232	Opal	198.	Si O ₂ H.	{ 23, 64, 1 } { 5, 8, 3 }	72		6-6.5	2-2.3		M A
233	Jenichite	201.	Si O ₂	1				2.6		
234	Enstatite	208.	MgO SiO ₂ or (MgO FeO) SiO ₂	7, 1, 5, 4, 8	31 to 72		5.5	3.1-3.3	6	III.
234	A. Victorite	Ap. 2-18		23		Z.				
235	Hypersthene	209.	(Mg O ₂ , Fe O) Si O ₂	8, 4-2	80	93.9	5-6	3.39	5	III.
236	Diopside	210.	(Mg O, Fe O, Ca O) Si O ₂	3, 4 to 7	31	F.			5	III.
237	Wollastonite	210.	Ca O Si O ₂	1-7	72	D.	4.5-5	9	4.5	IV.
237	A. Edelforsite	212.	2 Ca O 3 Si O ₂	1, 71, 5			6-7	2.584		
238	A. Omphacite	223.	R O R O ₃ Si O ₂				5-6	3.2-3.3		IV.
238	B. Violan	223.	Si Al Fe Mn Mg Ca Na	21, 58, 6	59		6	3.233		M.
239	Aegirite	223.	R ³ O Si ³ O ₂ - Fe O ₃ Si ³ O ₂	4, 2	72, 21, 4	W.	5.5-6	3.45-3.58		IV.
238	Pyroxene	212.	(R Si or (R ₂ R) (Si Al)) { 23, 1, 7 } { 8, 4, 2 }	72	87° & 93°		5.5-6	3.2-3.3	2.5-5	IV.
240	Acmite	224.	(Fe, Na) ³ Si ³ + 2 Fe Si ³	3-8 to 2-4	72	93°	6	3.4	2	IV.
241	Rhodonite	225.	Mn O SiO ₂	53-3 8-3	72	W.	5.5-6.5	3.61	2.5	V.
242	Babingtonite	227.	3 R ³ O Si ³ O ₂ - Fe O ₃ Si ³ O ₂	21, 4, 2					2.7	V.
243	Spodumene	228.	($\frac{1}{2}$ Li, Na) ³ + ($\frac{1}{2}$ Al) Si ³	1-7, 4-9	31	E.	6.5	3.18	3.5	IV.
244	Petalite	229.	Al O ₃ , Li O, Na O, Si O ₂	1-7-9	78	D.	6.5	2.45		IV.
245	Kupferite	230.	Mg O Si O ₂	37, 4	72	W.	5.5	3.08		III.
246	Anthophyllite	231.	Fe O Si O ₂ + 3 Mg O Si O ₂	8, 7, 4	79	E.	5.5	3.2	6	III.
246	A. Piddingtonite	232.	R O R O ₃ + Si O ₂	87, 71	Res.	W.	6.5	3.421		
247	Amphibole	232.	R Si & (R ₂ R) (Si Al)) { 2, 3, 1, 7 } { 8, 4, 23 }	72	87°, 93°		5-5.6	3.2-3.5	2.5-5	IV.
247	A. Waldheimite	242.	R O Si O ₂	35, 4			5	2.957		IV.
247	B. Kokscharoffite	242.	R O Si O ₂ + R O ₃ Si O ₂	23, 22, 1, 8			5-5.5	2.97		IV.
247	C. Schefferite	242.	R O + Si O ₂ - R O Si O ₂	8, 63, 3	72	A.	5-5.5	3.433		IV.
247	D. Nigrescrite	Ap. 1-12	R + R O R O ₃ Si O ₂	43, 4		II.	2	2.845		M.
248	Arfvedsonite	243.	Fe O ₃ Fe O Mn O Na O Si O ₂	2	72	W. at 123°	6	3.4	2	IV.
249	Crocidolite	243.	Fe O Mg O, Na, O Si O ₂ H.	4 to 49, 6	79	U.	4	3.2		F.
250	Wichtsite	244.	($\frac{1}{2}$ R ³ O + $\frac{1}{2}$ R O ₃) Si ³ O ₂	2	66	Z.		3.03		E.
251	Glaucophane	244.	($\frac{2}{3}$ R ³ O + $\frac{1}{3}$ R O ₃) Si ³ O ₂	6, 7	72, 31	F.	5.5	3.103-3.113		III.
252	Sordavalite	244.	Al O ₃ , Fe O, Mg O, Si O ₂ H	7, 2	70		2.5	2.58	2.5	M.

Species No.	SPECIES.	Page in Dank	COMPOSITION.	Color	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystalliza- tion.
253	Tachylite.....	245..	Fe, Mg, Ca, Na, Al, Si, H	7, 51, 2	72		6.5	2.6	2.5	
253	A. Hyalomelan.....	245..	3 R O, Al O ₃ 4 1/2 Si O ₂ ?	7, 51, 2	72		6.5	2.71	E	
254	Beryl.....	245..	(1/3 Be ³ O + 1/3 Al O ₃) ³ Si O ₂	23, 9, 6, 5, 4	72		7.5-8	2.6-2.7	5.5	VI..
255	Endialyte.....	248..	(1/3 (Ca, Na, Fe) ² + 1/3 Zr) ² Si	53 to 8.3	72	D	5.5	2.9	2.5	VI..
256	Pollucite.....	249..	(R. ³ O Al O ₃) ³ Si O ₂ + 1/3 H	23	72, 75	A	6.5	2.901	6	L..
257	Forsterite.....	255..	2 Mg O Si O ₂	1.7	72	E	6-7	3.2-3.3		III..
258	Monticellite.....	255..	(1/3 Ca O + 1/3 Mg O) ² Si O ₂	1.7	72	E	5-5.5	3-3.2	6	III..
259	Chrysotile.....	256..	(Mg O, Fe O) ² Si O ₂	34, 4	72	E	7	3.3-3.5		III..
259	A. Hortonclite.....	Ap. 1-7	(Fe O, Mg O Mn O) ² Si O ₂	5, 2	22, 1	E	6.5	3.9	4	III..
260	Fayalite.....	259..	2 Fe O Si O ₂	2	8	E	6.5	4.1	3	M..
261	Iron Manganese Chry- solite	258..	R O R O ₃ Si ² O ₂	2	8	E	6.5	4.1	3	
261	A. Roeperite.....	Ap 1-13	(Fe, Mn, Zn, Mg) ² Si.....	21, 4 to 2	72	V	6	4	Diff.	III..
262	Tephroite.....	259..	Mn ² O, Si O ₂	3, 8, 47, 7	72		6	4	3.5	III..
262	A. Hydrotrochroite.....	260..	(Mn O, Mg O) ² Si ₂ O + 1/3 H	10, 3	23		4			
263	Knebelite.....	260..	(Fe O Mn O) ² Si O ₂	7, 3, 8, 2			6.5	4.12	E	Cry
264	Leucophanite.....	260..	Ca O, Na O, Be O Si O ₃ Fl.		72	D	3.5-4	2.97	3	III..
265	Wöhlerite.....	261..	Ca O Na O Zr O ₂ Cb O ₂ Si O ₂	5, 8	72	E	5.5	3.41	3	III..
266	Willemite.....	262..	Zn ² O Si O ₂	23, 8, 5, 3, 4	72, 70		5.5	3.9-4.2	3.5-5	VI..
267	Phenacite.....	263..	Be ² O Si O ₂	23, 5, 8	72	Z	7-8	3		VI..
268	Meliphanite.....	263..	R O R O ₃ Si O ₂	5	72	F	5	3.0	E	VI..
269	Garnet.....	265..	(1/3 Fe O ₃ + 1/3 Al O ₃) ² Si ³ O ₂	3 or 8, 3	72		7-7.5	4	3	I..
270	Danailite.....	265..	{(1/2 (Zn Fe, Mn) + 1/2 Be) ³ Si O ₂ + 1/3 Zn S.....}	48, 3, 7	72		5.5-6	3.43	E	I..
271	Helvite.....	264..	{(1/2 (Mn, Fe) + 1/2 Be) ² Si + 1/3 Mn S.....}	59 or 45, 5	70		6-6.5	3.2	3	I..
272	Zirc.....	272..	Zr O ₂ Si O ₂	23, 3, 7, 8	71		7.5	4.4-4.6		II..
272	A. Melacon.....	275..		8, 3, 8	72 sub 72		6.5	3.9-4.07		
272	B. Cyrtolite.....	275..		8, 3	71		5-5.5	3.98-4.04		
272	C. Tachyphalite.....	275..		8, 3	sb 73 or 72		5.5	3.629		II..
272	D. Erstedite.....	275..		8, 3	71, 81		5.5	4.06		
272	E. Auerbachite.....	276..		8, 7	78 72		6.5	4.05		
272	F. Bragite.....	276, 525	R O, R O ₃ , Cb O ₃ , Y O	8	5, 8		6-6.5	5.13-5.35		II..
273	Vesuvianite.....	276..	(1/3 Ca ³ + 2/3 (Al, Fe) ² Si ³	8, 4, 5, 6	72		6.5	3.3-3.4	3	II..
274	Melilite.....	280..	Ca Mg Na Al Fe Si O	1, 5, 8	72	D	5	2.95	3	II..
275	Sphenoclas.....	280..	Si ₂ O Al O ₃ Fe O Mn O Mg O Ca O	19, 7, 5			5-6	3.2	3	M..
276	Epidote.....	281..	(1/3 Ca ³ + 2/3 (Al, Fe) ² Si ³	7, 39, 4, 8, 5	72	2 cleav	6.7	3.2-3.5	3-3.5	IV..
276	A. Koelbingite.....	284..	R O Si O ₂	4 to 2	72, 39, 4		5.5-6	3.599		IV..
277	Piedmontite.....	285..	Ca Fe Al Si O	27, 3, 3-8	E	72	6.5	3.4	3	IV..
278	Allanite.....	285..	Al, Ce, La, Di, Fe, Ca, Si	8, 2			5.5-6	3.42	2.5	IV..
279	Murumontite.....	289..	R O ₃ , Si O ₂ , Y O	2 or 4, 2	72		7	4.25		A..
279	A. Bodenite.....	289..	R O R O ₃ Ce O		72		4-5	3.44		M..
279	B. Michaelsonite.....	289..	R O, R O ₃ , Si O ₂ La O		72		4-5	3.44		M..
280	Zoisite.....	290..	{(1/3 Ca ³ + 2/3 (Al, Fe) ² Si ³ O ₂}	1, 47, 7	72	E	6-6.5	3-3.3	3-3.5	III..
280	A. Jadeite.....	292..	R O, R O ₃ , Si O ₂	43, 4, 1	31		6.5-7	3.33-3.35	E	M..
281	Partschinite.....	293..	R O, R O ₃ , Si O ₂	5, 3	78	sub. Z	6.5-7	4.006		IV..
282	Gadolinite.....	293..	Y O, Ce O, Fe O, Be O, Si O ₂	2, 4 to 2	72		6.5-7	4-4.5		III..
283	Mosandrite.....	295..	Ge O ₂ Ca O Na O Ti O ₂ Si O ₂ H	3, 8	70	E	4	2.95	3	III..
284	Ilvaite.....	296..	Fe O Fe O ₃ Ca O Mn O Si O ₂	2	2		2.5-6	3.8-4	2.5	III..
284	A. Ardenite.....	Ap 2-4	R O ₃ , R O, Si O ₂ , V O ₅							
285	Axinite.....	297..	Al Mn, Fe, Ca, Si, B	63, 8 to 31, 7	72		6.5-7.5	3.27	2	V
286	Danburite.....	299..	Ca ² O Si O ₂ + B ² O ₃ Si ₂ O ₂	19, 5	72		7	2.9	3	V
287	Iolite.....	299..	2 (Mg Fe) Si + Al ² Si ³	6	72		7	2.6	5-5.5	III..
288	Phlogopite.....	302..	2/3 (Mg R) ³ + 1/3 Al ² Si ³	5, 3, 1	31	L	2.5	2.8	5	III..
288	A. Aspidolite.....	Ap. 1-2	R O R O ₃ Si O ₂	34, 4	21	L	1-2	2.72	6	III..
289	Biotite.....	304..	{(1/3 Mg O, K O) ³ + 1/3 (Al O ₃ , Fe O ₃) ² 3 Si O ₂}	4, 2	81	L	2.5	3	6	VI..
290	Lepidomelan.....	307..	K Mg Al Fe Si O	21, 4 to 2	72	Mi	3	3	E	VI..
290	A. Manganophyllite.....	Ap 2-36	R O R O ₂ + Si O ₂	15 to 10, 3	19, 3		3	3.169		
291	Annite.....	308..	R O R O ₂ Si O ₂	2	21, 4		3	3.169		
292	Astrophyllite.....	308..	{Al O ₃ , Fe O ₃ , Mn O, Mg O, Fe O, Na O, K O, Ti O, Si O ₂}	15, 5	31	Mi	3	3.32	E	III..
293	Muscovite.....	309..	Al O ₃ Fe O ₃ K O ² Si O ₂ H	7, 1, 8, 4	31	Mi	2.5	2.8-3	5.1	III..
294	Lepidolite.....	314..	Al O ₃ Fe O K O Li O Si O ₂ Fl	53, 3 and 7, 1	72	Mi	2.5-3	2.8-3	2-2.5	III..
295	Cryptophyllite.....	316..	Al O ₃ Fe O K O Li O Si O ₂ H	2, 4 to 8, 3	31	Mi	2.5	2.91	1.5-2	II..
295	A. Snarumite.....	317..	Si O ₂ Al O ₃ Si O Na O K O	3, 1, 23, 7			4-5.5	2.826		M..
296	Sarcinite.....	317..	R O R O ₃ Li O ₂	3, 53	72	F	6	2.545	E	II..
297	Meionite.....	318..	(1/3 (Ca, Na) ³ + 2/3 Al) ² Si ³	23 to 1	72		5.5	2.7	3	II..

Species No.	SPECIES.	Pages in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystal-formation.	
298	Paranthite.....	315...	$\frac{1}{2} \text{CaO} + \frac{3}{4} \text{Al}_2\text{O}_3 + 2\text{SiO}_2$	1, 7, 19, 4.	31, 72.	Mass.	5.5...	2.736...	E.	II.	
299	Wernerite.....	319...	$\text{AlO}_3 \cdot \text{FeO}_3 \cdot \text{CaO} \cdot \text{NaO} \cdot \text{KO} \cdot \text{SiO}_2$	1, 7, 6, 4, 2.	72 to 78.	E.	5-6.	2.6-2.8.	2.5.	II.	
300	Ekebergite.....	324...	$\{ \frac{1}{2} (\text{CaO} \cdot \text{NaO}) + \frac{3}{4} \text{Al}_2\text{O}_3 \}$	1, 7, 4, 6, 3.	72.	E.	5.5-6.	2.74.	E.	II.	
301	Mizzonite.....	325...	$\text{Ca} \cdot \text{Na} \cdot \text{Al} \cdot \text{SiO}_2$	23 to 1.	72.	E.	5.5-6.	2.623.	E.	II.	
302	Dipyrite.....	326...	$\text{Ca} \cdot \text{Na} \cdot \text{Al} \cdot \text{SiO}_2$	23, 1, 4, 3.	72, 31.	E.	5-5.5.	2.646.	M.	II.	
303	Mariakite.....	326...	$\text{Ca} \cdot \text{Na} \cdot \text{Al} \cdot \text{SiO}_2$	23 or 1.	72.	E.	5.5-6.	5.626.	E.	II.	
304	Nephelite.....	327...	$\text{NaO} \cdot \text{K}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot \text{FeO}_3 \cdot \text{SiO}_2$	23 and 4, 3.	72 to 78.	Y.	5.5-6.	2.6.	3.5.	VI.	
304	A. Cancrinite.....	329...	$\text{AlO}_3 \cdot \text{CaO} \cdot \text{NaO} \cdot \text{CO}_2 \cdot \text{SiO}_2$	1, 9, 7, 5.	72.	Y.	5-6.	2.5.	2.5.	VI.	
305	Sodalite.....	330...	$\{ \frac{1}{2} \text{Na}_2\text{O} + \frac{3}{4} \text{Al}_2\text{O}_3 \}$	7, 4, 6, 5, 1.	72.	E.	5.5-6.	2.3.	3.5-4.	I.	
305	A. Microsommitte.....	Ap 2-39	$\text{RO} \cdot \text{RO}_2 \cdot \text{SiO}_2$	23.	72.	E.	5-6.	2.60.	3.	I.	
306	Lapis-Lazuli.....	331...	$\text{CaO} \cdot \text{NaO} \cdot \text{AlO}_3 \cdot \text{FeO}_3 \cdot \text{SO}_2 \cdot \text{SiO}_2$	33, 6.	72.	E.	5-5.5.	2.4.	3.	I.	
307	Hall'sonite.....	332...	$\{ \frac{1}{2} \text{Na}_2\text{O} + \frac{3}{4} \text{Al}_2\text{O}_3 \}$	4 to 6.	72.	N.	5.5-6.	2.5.	4.5.	I.	
308	Nosite.....	333...	$\{ \frac{1}{2} \text{Na}_2\text{O} + \frac{3}{4} \text{Al}_2\text{O}_3 \}$	7 to 2.	72.	E.	5.5.	2.3.	4.5.	I.	
309	Leucite.....	334...	$\text{K}_2\text{O} \cdot \text{SiO}_2 + \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$	1, 7.	72.	E.	5.5.	2.4.	4.5.	I.	
309	A. Maskelynite.....	Ap 2-37	$\text{SiO}_2 \cdot \text{Al}_2\text{O}_3 \cdot \text{CaO} \cdot \text{NaO} \cdot \text{K}_2\text{O}$	23, 1, 7.	72.	2=Clvs	6-7.	2.7.	4.5.	V.	
310	Anorthite.....	337...	$\text{CaO} \cdot \text{SiO}_2 + \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$	23, 1, 7.	72.	2=Clvs	6-7.	2.7.	4.5.	V.	
310	A. Cyclopite.....	340...	$\text{RO} \cdot \text{RO}_2 \cdot \text{SiO}_2$	1.	72.	C.	5.5-6.	2.75.	4.	M.	
310	B. Barrowite.....	340...	$\text{Ca} \cdot \text{Mg} \cdot \text{AlO}_3 \cdot \text{FeO}_3 \cdot \text{SiO}_2$	60, 1.	31.	C.	5.5-6.	2.74.	5.	M.	
310	C. Bytownite.....	340...	$\text{SiO}_2 \cdot \text{Al}_2\text{O}_3 \cdot \text{MgO} \cdot \text{CaO} \cdot \text{SiO}_2$	1, 7, 8, 4.	72.	{ Angle 94°	5.5-6.	2.61-2.74.	5.	V.	
311	Labradorite.....	341...	$\{ \frac{1}{2} (\text{CaO} \cdot \text{NaO}) + \frac{3}{4} \text{Al}_2\text{O}_3 \}$	1, 7, 4, 5, 3.	sub 72, 31.	H.	5.5-6.	2.61-2.74.	5.	V.	
312	Andesite.....	344...	$\text{K}_2\text{O} \cdot \text{BaO} \cdot \text{AlO}_3 \cdot \text{SiO}_2$	1, 48, 3.	72.	2 Clvs.	6.	2.9.	5.	IV.	
313	Hyalophane.....	346...	$\text{NaO} \cdot \text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$	1, 48, 3.	72.	93°	6.	2.6-2.7.	3.5.	V.	
314	Oligoclase.....	346...	$\text{K}_2\text{O} \cdot \text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$	7 to 1.	72.	6.	6.	2.64.	4.	M.	
314	A. Tschermakite.....	Ap 2-57	$3 \text{RO} \cdot \text{SiO}_2 + \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$	23 to 1, 7, 6, 4.	72.	93° 30'	6.	2.6.	4.	V.	
315	Albite.....	348...	$\text{NaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$	{ 23 to 1, }	72.	{ Right Angle	6.	2.5-2.6.	5.	IV.	
316	Orthoclase.....	352...	$\text{K}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$	{ 48, 3, 7, }	72.	{ Angle	6.	2.5-2.6.	5.	IV.	
317	.....	353...	$8 \text{MgO} \cdot \text{Si}_2\text{O}_7 \cdot \text{Al}_2\text{O}_3$	1, 3, 5, 8, 4.	72, 70.	E.	6.5.	3.2.	3.5.	VI.	
318	Chondrodite.....	353...	$8 \text{MgO} \cdot \text{Si}_2\text{O}_7 \cdot \text{Al}_2\text{O}_3$	2, 8, 4, 6, 9, 1.	72.	E.	6.5-7.5.	2.9-3.3.	3-5.	VI.	
320	Tourmaline.....	365...	$\text{Al, Fe, Mn, Mg, Si, B, F, Cl}$	7, 1.	70.	E.	5.5-6.	3.	5.7.	II.	
321	Gehlenite.....	370...	$\{ \frac{1}{2} (\text{CaO} \cdot \text{MgO}) + \frac{3}{4} \text{Al}_2\text{O}_3 \}$	1, 7, 5, 3.	72.	E.	7.5.	3.2.	5.	III.	
322	Andalusite.....	371...	$\text{Al}_2\text{O}_3 \cdot \text{SiO}_2$	5, 3, 1.	60.	E.	2.	2.5.	5.	IV.	
322	A. Myelin.....	373...	$\text{Al}_2\text{O}_3 \cdot \text{SiO}_2$	1, 8, 4, 3.	72.	E.	6-7.	3.2.	5.	IV.	
323	Fibrolite.....	373...	$\text{Al}_2\text{O}_3 \cdot \text{SiO}_2$	57, 3.	72.	E.	2.5.	3.6.	5.	V.	
323	A. Westanite.....	Ap 1-16	$\text{Al}_2\text{O}_3 \cdot \text{SiO}_2 \cdot \text{FeO}_3 \cdot \text{FeO}_3 \cdot \text{SiO}_2$	6, 1, 7, 4, 2.	72, 31.	E.	5.7.	3.6.	5.	V.	
24	Cyanite.....	375...	$\text{Al}_2\text{O}_3 \cdot \text{SiO}_2$	23, 1, 6, 4, 5.	72.	D.	5.8.	3.6.	5.	III.	
325	Topaz.....	376...	$\text{AlO}_3 \cdot \text{SiO}_2 \cdot \text{F}_2$	38, 4, 6, 1.	72.	E.	7.5.	3.1.	5.5.	IV.	
326	Eucalase.....	379...	$(\frac{1}{2} \text{H}_2 + \frac{3}{2} \text{Eu}_2\text{O}_3 + \frac{3}{2} \text{Al}_2\text{O}_3) \cdot \text{SiO}_2$	23, 1, 4, 5, 3.	72.	E.	5.5.	3.	5.	IV.	
327	Datolite.....	380...	$(\text{CaO} + \text{H}_2\text{O} + \text{B}_2\text{O}_3) \cdot \text{SiO}_2$	45, 5.	72.	E.	6.	3.48.	3.	II.	
328	Guarinite.....	383...	$\text{CaO} + \text{TiO}_2 \cdot \text{SiO}_2$	63 to 2, 8.	72 to 78.	E.	6.5.	3.52-3.60.	3.	IV.	
330	Grothite.....	386...	$\text{RO} \cdot \text{RO}_2 \cdot \text{TiO}_2 \cdot \text{SiO}_2$	8, 2.	70.	U.	6.5.	3.5.	3.	IV.	
331	Kelhaite.....	387...	$\text{CaO} \cdot \text{FeO} \cdot \text{AlO}_3 \cdot \text{TiO}_2 \cdot \text{SiO}_2$	8, 3, 2.	72.	E.	5.5-5.5.	3.5.	3.	IV.	
332	Tschefkinitite.....	387...	$\text{AlO}_3 \cdot \text{FeO}_3 \cdot \text{FeO} \cdot \text{MgO} \cdot \text{SiO}_2$	2.	72.	E.	7-7.5.	3.6.	3.	IV.	
333	Staurolite.....	388...	$\text{FeO}_3 \cdot \text{CaO} \cdot \text{TiO}_2 \cdot \text{SiO}_2$	19, 6, 4.	72.	E.	7-8.	3.42-3.48.	3.	IV.	
334	Schorlomite.....	390...	$3 \text{MgO} + 4 \text{Al}_2\text{O}_3 + \frac{1}{2} \text{SiO}_2$	4.	66-7.	E.	4.5.	6.1.	5.	IV.	
335	Sapphirine.....	391...	$\text{RO} \cdot \text{RO}_2 \cdot \text{SiO}_2$	21, 55 to 5.	70.	E.	4.5.	6.1.	5.	IV.	
335	A. Trautwinitte.....	Ap 2-56	$\text{Bi}_2\text{O}_3 \cdot \text{Si}_2\text{O}_7$	8, 23, 5.	70.	E.	soft.	6.1.	5.	IV.	
336	Eulytite.....	391...	$\text{Bi}_2\text{O}_3 \cdot \text{Si}_2\text{O}_7$	24, 5.	71, 78.	E.	5.	6.	2.9-3.04.	5.	IV.
336	A. Agricolaite.....	Ap 2-1	$\text{SiO}_2 \cdot \text{AlO}_3 \cdot \text{BiO}_3 \cdot \text{FeO} \cdot \text{PO}_3 \cdot \text{Mn}$	1 to 7.	72, 4, 7.	F. Z.	6-6.5.	2.9-3.	5.	IV.	
337	Atestatite.....	392...	$\text{SiO}_2 \cdot \text{AlO}_3 \cdot \text{FeO}_3 \cdot \text{CaO} \cdot \text{CuO}$	7 or 2.	72, 4, 7.	E.	6-6.5.	2.9-3.	5.	IV.	
338	Hypochlorite.....	392...	$(\frac{1}{2} \text{Ca} + \frac{1}{2} \text{Na} + \frac{1}{2} \text{H}) \cdot \text{SiO}_2$	1 to 7.	79.	U.	5.	2.7.	2.	IV.	
338	Isohyre.....	392...	$4 \text{CaO} \cdot \text{SiO}_2 + \text{H}_2\text{O}$	1 to 7.	79.	U.	5.	2.71.	2.	IV.	
339	Pectolite.....	396...	$\text{CaO} \cdot \text{SiO}_2 + 2 \text{H}_2\text{O}$	1.	72.	U.	soft.	2.3.	5.	III?	
340	Xonaltite.....	397...	$(\frac{1}{2} \text{H}_2 + \frac{1}{2} \text{NiO} \cdot \text{MgO}) \cdot \text{SiO}_2$	6, 34, 4.	74.	W.	2.5-3.	2.66.	5.	VI.	
341	Okenite.....	398...	$\text{MgO} \cdot \text{SiO}_2 + \frac{1}{2} \text{H}$	0-34-4.	74.	W.	2.5-3.	2.66.	5.	VI.	
341	A. Centrallassite.....	796...	$\text{RO} \cdot \text{RO}_2 \cdot \text{SiO}_2$	1 or 5.	31.	U.	3.5.	2.45.	5.	III?	
341	B. Cyanolite.....	797...	"	6, 7.	31.	U.	4.5.	2.495.	5.	III?	
342	Gyrolite.....	798...	$(\frac{1}{2} \text{CaO} + \frac{1}{2} \text{H}) \cdot \text{SiO}_2 + \text{H}$	1.	72, 31.	E.	3-4.	2.4.	5.	III?	
343	Laumontite.....	399...	$\text{CaO} \cdot \text{AlO}_3 \cdot \text{Si}_2\text{O}_7 \cdot \text{H}_2\text{O}$	1, 7, 3.	31.	E.	3.5.	2.3.	5.	IV.	
343	A. Leonhardite.....	401...	$\text{SiO}_2 \cdot \text{Al}_2\text{O}_3 \cdot \text{CaO} \cdot \text{H}_2\text{O}$	1, 5, 8.	31, 72.	W.	3-3.5.	2.26.	5.	IV.	
344	Catapleite.....	401...	$\text{ZrO}_2 \cdot \text{NaO} \cdot \text{CaO} \cdot \text{SiO}_2 \cdot \text{H}_2\text{O}$	5, 8.	72.	E.	6.	2.8.	3.	VI.	
345	Diopside.....	401...	$\text{CuO} \cdot \text{SiO}_2 + \text{H}_2\text{O}$	37, 4.	72.	I.	5.	3.3.	5.	VI.	
346	Chrysocolite.....	402...	$\text{CuO} \cdot \text{SiO}_2 + 2 \text{H}_2\text{O}$	6 to 4.	72.	I.	2-4.	2.2.	5.	VI.	
346	A. Cyanochalcite.....	Ap 1-4	$\text{SiO}_2 \cdot \text{P}_2\text{O}_5 \cdot \text{CuO} \cdot \text{H}_2\text{O}$	33, 6.	74 to 66.	S.	4.5.	2.79.	5.	VI.	
346	B. Resanite.....	Ap 2-48	$\text{R}_2\text{O} \cdot \text{Si}_2\text{O}_7 + 9 \text{aq}$	34, 4.	74.	S.	2.06.	1.44-1.46.	5.	VI.	
347	Albite.....	404...	$(\frac{1}{2} \text{H} + \frac{1}{2} \text{NiO} \cdot \text{MgO}) \cdot \text{SiO}_2$	6, 34, 4.	74.	W.	2.5-3.	2.66.	5.	VI.	
348	Conarite.....	405...	$(\frac{1}{2} \text{H} + \frac{1}{2} \text{NiO}) \cdot \text{SiO}_2 + \frac{1}{2} \text{H}$	6, 34, 4.	74.	W.	2.5-3.	2.66.	5.	VI.	
349	Picrosmine.....	405...	$\text{MgO} \cdot \text{SiO}_2 + \frac{1}{2} \text{H}$	0-34-4.	74.	W.	2.5-3.	2.66.	5.	VI.	
349	A. Hydrosilicite.....	799...	$\text{RO} \cdot \text{SiO}_2 + \text{H}$	3.	31, 78.	J. Z.	2.5.	2.66.	5.	VI.	
350	Padaitite.....	405...	$(\frac{1}{2} \text{Mg} + \frac{1}{2} \text{H}) \cdot \text{SiO}_2 + \frac{1}{2} \text{H}$	3.	31, 78.	J. Z.	2.5.	2.66.	5.	VI.	
351	Pyralloite.....	406...	Pyroxene altering into Steatite	3.	31, 78.	J. Z.	2.5.	2.66.	5.	VI.	
352	Cyclophyll.....	406...	Steatite	3.	31, 78.	J. Z.	2.5.	2.66.	5.	VI.	

Species No.	SPECIES.	Page in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystalization.
353	Traversellite.....	406...	Pyroxene altering into Steatite.....							
354	Pitkarandite.....	406...								
355	Strakonitzite.....	406...								
356	Monradite.....	406...	Mg O, Fe O, Si O ₂ , H.....	5.....	72.....		6.....	3.7.....		
357	Neolite.....	406...	Mg O, Al O ₃ , Si O ₂ , H.....	4.....	72.....		1-2.....	2.77.....	F.....	
358	Paligorskite.....	406...	R O, R' O ₂ , Si O ₂ , H.....	1.....		K.....		2.27.....	F.....	
359	Xylotile.....	406...	Fe O ₂ , Mg O, H, Si O ₂	52, 8.....	79.....	U.....		2.4.....	E.....	
360	Anthosiderite.....	407...	Fe ² O ₃ , Si ² O ₃ + 2 H.....	44, 5, 5, 8.....	79.....	K.....	6.5.....	3.....	5.5.....	F.....
361	Calamine.....	407...	Zn ² O Si O ₂ + H.....	23, 1, 5, 4, 6.....	72.....	E.....	4-4.5.....	3.5.....	6.....	III.
362	Villarsite.....	409...	($\frac{1}{2}$ Mg + $\frac{1}{2}$ Fe) Si + $\frac{1}{2}$ H.....				4-5.....	2.978.....		III.
362	A. Moresnetite.....	409...	Si O ₂ , Al O ₃ , Zn O, Ni O.....	4.....		Z.....	2.5.....			D.
363	Prehnite.....	410...	Ca, $\frac{2}{3}$ (Al, Fe), Si ² , H ⁵	43 to 62, 4, 1.....	72.....	D.....	6-6.5.....	2.9.....	2.....	III.
363	A. Uigite.....	412...	R O, R' O ₂ , Si O ₂	1, 6.....	31.....		5.5.....	2.284.....	E.....	
364	Chlorastrolite.....	412...	R O, R' O ₂ , Si O ₂	6, 4.....	31.....		5.5-6.....	3.180.....	E.....	M.
365	Tritomite.....	412...		56, 8.....	sub 73, 72.....		5.5.....	3.9-4.66.....		I.
366	Thorite.....	413...	Th O ₂ , Si O ₂ + $\frac{1}{2}$ H.....	56, 8, 2.....	70.....		4.5-5.....	5-5.4.....		I.
367	Cerite.....	413...	(CeO, LaO, DiO) Si O ₂ + H.....	27, 3, 63, 8.....	70.....		5.5.....	4.3.....		
368	Erdmannite.....	414...	R O, R' O ₂ , Si O ₂ , La.....	21, 8.....	72.....		3.1.....	6.....		
369	Pyrosmalite.....	414...	Mn O, Fe O, Si O ₂ , Cl, H.....	8 to 2, 4.....	31.....	D.....	4.5.....	3.16.....	2.5.....	VI.
370	Apophyllite.....	415...	($\frac{1}{2}$ (Ca, K) + $\frac{1}{2}$ H) Si + H Si.....	23, 1, 53, 3, 5.....	72, 31.....	D.....	5.....	2.3.....	1.5.....	II.
370	A. Chalcomorphite.....	Ap. 2-11	Si O ₂ , Al O ₃ , Ca O, H, CO ₂	1.....	82.....		5.....	2.54.....	6.....	VI.
371	Edingtonite.....	417...	Al O ₃ , Ba O, Si O ₂ , H.....	1, 9.....	72.....	E.....	4.5.....	2.7.....	E.....	II.
372	Gismondite.....	418...	Al O ₃ , Ca O, K O, Si O ₂ , H.....	6, 1 to 1.....	81.....		4.5.....	2.26.....	E.....	III.
373	Carpholite.....	419...	(Al, Fe, Mn) Si ³ + 3 H.....	46, 5.....	79.....	U.....	5-5.5.....	2.9.....	3.5.....	III.
374	Allophane.....	419...	Al O ₃ , Si O ₂ + 6 H.....	1, 6, 5, 4.....	70, 72.....	F.....	3.....	1.87.....		A.
375	Collyrite.....	420...	Al ² O ₃ , Si O ₂ + 9 H.....	1.....	74.....		1-2.....	2.1.....		A.
375	A. Dillinite.....	421...	Al ⁴ O ₃ Si ³ O ₂ + 9 H.....	1.....			1.8-2.....	2.574-2.883.....		
376	Schröterite.....	421...	Al ⁸ O ₃ Si ³ O ₂ + 30 H.....	1, 4.....	70.....		3.5.....	2.....		
376	A. Scarbroite.....	421...	Si O ₂ , Al O ₃ , H.....	1.....			2.0.....	1.485.....		
376	B. Uranophane.....	805...	($\frac{1}{3}$ R ³ + $\frac{2}{3}$ R) Si + 3 H.....	45-5-35-4.2.....			2.5-3.....	2.6-2.8.....		III.
377	Thomsonite.....	424...	(Ca Na), Al, 2 Si, 2 $\frac{1}{2}$ H.....	1.....	72.....	E.....	5.....	2.35.....	2.....	III.
377	A. Raute.....	Ap. 2-47	R O, R' O ₂ , Si O ₂ , H.....	7, 2.....			5.....	2.48.....	6.....	M.
378	Natrolite.....	426...	Na O, Al O ₃ , Si ³ O ₂ , H ²	1 to 3.....	72.....		5.5.....	2.25.....	2.....	II.
379	Scolecite.....	428...	Ca O, Al O ₃ , Si ³ O ₂ , H ³	1.....	72.....	E.....	5.5.....	2.2.....	2.2.....	IV.
380	Ellagitite.....	430...	R O, R' O ₂ , Si O ₂ , H.....	8, 5.....		W.....				M.
381	Messelite.....	430...	(CaO NaO) Al ³ O ₃ , Si O ₂ , 3 H.....		79.....	U.....		2.3.....		V ² .
382	Levynite.....	431...	3 Si, Al, (Ca, Na, K), 4 H.....	23, 1, 7, 4, 3.....	72.....		4-4.5.....	2.09-2.16.....		VI.
383	Amidite.....	432...	Al O ₃ , Na O, Si ⁴ O ₂ , H ²	23 to 1, 7, 4, 5, 3.....	72.....	not Clef.....	5-5.5.....	2.28.....	2.5.....	I.
384	Eudnophite.....	433...	Si O ₂ , Al O ₃ , Na O, H.....	1, 7, 8.....	1.....		5.5.....	2.21.....	E.....	III.
385	Faujasite.....	433...	4 $\frac{1}{2}$ Si, Al ($\frac{1}{2}$ Ca + $\frac{1}{2}$ Na), 9 H.....	23, 1, 8.....	72.....	H.....	5.....	1.923.....	E.....	I.
386	Chabazite.....	434...	4 Si Al, ($\frac{2}{3}$ Ca + $\frac{1}{3}$ (Na K)) 6.....	1, 3.....	72.....	F. H.....	4-5.....	2.08-2.19.....	E.....	VI.
387	Gmelinite.....	436...	4 Si Al, $\frac{1}{2}$ Ca + $\frac{1}{2}$ (Na K) 6 H.....	23, 5, 1, 4.....	72.....	F.....	4.5.....	2.04-2.17.....	2.5-3.....	VI.
388	Herschelite.....	437...	($\frac{1}{2}$ K O), 5 H.....	23 or 1.....	72.....	D.....	5.5.....	2.06.....	E.....	III.
389	Phillipsite.....	438...	(Ca, K), Al O ₃ , 4 Si O ₂ , 3 H.....	1, (3).....	72.....		4-4.5.....	2.2.....	3.....	III.
390	Harmotome.....	439...	Ba O, Al O ₃ , Si ³ O ₂ , H ³	1, 3.....	72.....		4.5.....	2.45.....	3.5.....	III.
391	Hypostilbite.....	441...	(Na, Ca) Al, 4 $\frac{1}{2}$ Si, H ⁶		72.....	U.....	3.5-4.....	2.2.....		E.
392	Stilbite.....	442...	Ca O, Al O ₃ , Si ³ O ₂ , H ⁶	1, 5, 3.....	31, 72.....	E.....	3.5-4.....	2.16.....	2-25.2.....	III.
393	Epistilbite.....	443...	6 Si, Al, ($\frac{1}{2}$ Ca + $\frac{1}{2}$ Na) 5 H.....	1, 6, 5.....	72.....	H.....	4-4.5.....	2.249.....	E.....	III.
393	A. Reissite.....	Ap. 1-14	R O, R' O ₂ , Li O ₂ , H.....	23 to 1.....	72.....					III.
394	Heulandite.....	444...	Ca O, Al O ₃ , Si ² O ₂ , H ⁵	1, 3.....	31, 72.....	Cld.....	3.5-4.....	2.2.....	2-2.5.....	IV.
395	Brewsterite.....	445...	Al O ₃ $\frac{2}{3}$ Sr + $\frac{1}{3}$ Ba) Si ⁶ H ³	5, 1, to 7.....	31, 72.....	E.....	5.....	2.45.....	3.....	IV.
396	Mordenite.....	446...	(Na, Ca, Al, Si ³ , H ⁶	1.....	79.....	Cry.....	5.....	2.08.....	E.....	
396	Sloanite.....	446...	R O, R' O ₂ , Li O ₂ , H.....	1.....	31, 1.....	ct.....	4.5.....	2.441.....	E.....	III.
398	Saspachite.....	447...	R O, R' O ₂ , Li ₂ O, H.....				4.5.....	1.465.....	E.....	
398	Talc.....	451...	Mg O, Si ² O ₂ + 2 H.....	1, 43 to 21.....	31.....	L. S.....	1.....	2.7.....	6.....	III.
401	A. Talcoid.....	454...	Li O ₂ , Mg O, Fe O ₂ , H.....	60, 1.....						
401	Pyrophyllite.....	454...	Al O ₃ , Si ³ O ₂ + H.....	1, 7, 4.....	31.....	Mi to T.....	1-2.....	2.9.....	6.....	III.
401	P. Phillite.....	455...	(R ³ O, Al O ₃) Si ³ O ₂	1, 68, 5.....			1.5.....	2.72.....	6.....	
402	Sepiolite.....	456...	Mg ² O Si ³ O ₂ + 2 H.....	7, 1.....	60.....		2-2.5.....	2.21.....	5.....	C.
403	Aphrodite.....	457...	Mg O, Si O ₂ + 3 H.....	64, 1.....				2.21.....		C.
404	Cimolite.....	457...	Al ² O ₃ , Si ³ O ₂ + 3 H.....	1, 7, 3.....	68.....	Soft.....		2.2.....		A.
404	A. Sphragidite.....	458...	R O, R' O ₂ , Si O ₂ , H.....	5, 7, 8.....						A.
404	B. Ehrenbergite.....	458...	R O, R' O ₂ , Si O ₂ , H.....							A.
404	C. Anauxite.....	458...	Al O ₃ , Si O ₂ , H.....	4, 1.....			2-2.5.....	2.26.....		
404	D. Portite.....	458...	Al O ₃ , Si ³ O ₂ + 2 H.....	1.....	72.....	ct.....	5.....	2.4.....	F.....	III.
404	E. Nefedieffite.....	Ap. 2-41	H ₆ Mg Al ₂ Si ₃ O ₁₇	1, to 53, 3.....		Z.....	1.15.....	2.335.....		A.
405	Smectite.....	458...	($\frac{1}{2}$ Al + $\frac{1}{2}$ H ³) Si ³ + $\frac{1}{2}$ H.....	1, 7, 4.....	23.....		Soft.....	1.9-2.1.....		M.

Species No.	SPECIES.	Page in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
406	Montmorillonite.....	459...	$(\frac{1}{2} \text{Al} + \frac{1}{2} \text{H}^3) \text{Si}^3 + 5 \text{H}...$	1 to 7, 4.53, 3	.....	.....	Soft...	.....	E...	M...
406	A. Razoumoffskite.....	460...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	.....	.....	.....	.....	.....	.....	.....
407	Sulphomelane.....	460...	$\text{Fe, Fe, Al, Mg Li, H O}...$	15, 5, to 4, 7.	31 sub. 75	S...	.....	2.76...	L...	M...
408	Chloropal.....	461...	$(\text{Fe, Fe O}_3) \text{Si}^2 \text{O}_2 + 4 \frac{1}{2} \text{H}...$	39, 4 to 5...	77...	.....	2.5-4.5...	.....	.....	M...
409	Glaucanite.....	462...	$\text{Si K Fe Al Mg H O}...$	21, 34 to 54, 4	66...	.....	.....	2.2-2.4...	A...	.....
410	Celadonite.....	463...	$\text{Si O}_2, \text{Fe O}_3, \text{Mg O, K O, H}...$	22, 34, 4...	.....	.....	Soft...	.....	.....	.....
411	Serpentine.....	464...	$\{ 2 \text{ Mg O Si O}_2 + \text{Mg O} \}$ $\text{H, with small amount}$	$\{ 1, 7 \text{ various shades of Fe.} \}$	$\{ \text{Sub. 70, 78, 31, 70, 79 and 77...} \}$	K...	2.5-5.5...	2.5-2.65...	6...	Only found in Fauc.
412	Bastite, or Schiller.....	Spar 469	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	.....	.....	.....	3.4...	2.55...	6...	.....
412	A. Refianskite.....	803...	$\text{R O, Si O}_4, \text{H Ni}...$	22, 7, 4...	.....	.....	.....	2.77...	.....	M...
413	Deweyite.....	469...	$\text{Mg O, Si, O}_2 \text{H}...$	1, 5, 3...	78...	.....	3...	2.2...	5...	A...
414	Cerolite.....	470...	$\text{Si O}_2, \text{Mg O, H}...$	5, 3, 4...	.....	.....	2-2.5...	2.3...	.....	M...
414	A. Limbachite.....	Ap 2-34	$3 \text{ Mg} 2 \text{ Si} + \text{Al} \text{ Si} + 3 \text{ H}...$	7 to 4...	78...	.....	.....	2.395...	.....	M...
415	Hydrophile.....	470...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	.....	.....	.....	2.5-3.5...	2.65...	3...	M...
415	A. Dermatite.....	471...	$(\text{Mg O, Fe}^2 \text{ Si}^2 \text{O}_2 + 6 \text{H}$ $\text{Si O}_2, \text{Al O}_2, \text{Mg O, Fe O, H}...$	.....	72...	.....	.....	.....	.....	M...
415	B. Aquacryptite.....	Ap. 1-2	.....	8, 5...	66...	F...	2.5...	2.05...	.....	M...
416	Genthite.....	471...	$\text{Ni, Mg O, Si O}_2, \text{H}...$	43 to 37, 4...	70...	.....	3-4...	2.4...	.....	A...
417	Saponite.....	472...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	1, 5, 7, 6, 3, 4	78...	.....	Soft...	2.266...	6...	M...
418	Pholerite.....	472...	$\text{Al}^2 \text{O}_3, \text{Si}^2 \text{O}_2 + 4 \text{H}...$	1, 7, 3...	31...	.....	1-2...	2.5...	.....	III...
418	A. Teratolite.....	473...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	49, 6...	.....	.....	2-2 1/2...	2.49...	.....	.....
419	Kaolinite.....	473...	$\text{Al O}_3, \text{Si}^2 \text{O}_2 + 2 \text{H}...$	1, 7, 8...	31...	.....	1-2...	2.5...	.....	III...
420	Halloysite.....	475...	$\text{Al O}_3, \text{Si}^2 \text{O}_2 + 3 \text{H}...$	1, 7, 4, 5, 3...	59...	.....	1-2...	2...	.....	M...
420	A. Sinopite.....	477...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	37, 3...	.....	.....	.....	.....	.....	.....
420	B. Melinite.....	477...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	.....	.....	.....	.....	2.24...	.....	.....
420	C. Ochran.....	477...	$\text{Si O}_2, \text{Al O}_3, \text{Fe O}_3...$	.....	5 to 23...	.....	1-2...	2.4-2.5...	.....	.....
420	D. Oravitzite.....	477...	$\text{Si O}_2, \text{R O, R O}_3, \text{H Zn O}...$	4, 1...	59...	.....	2-2 1/2...	2.70...	.....	M...
420	E. Hyerleria.....	478...	$\text{Si O}_2, \text{Al O}_3, \text{Fe O}_3, \text{Mg O, Ti}...$	1, 3...	.....	.....	.....	.....	.....	.....
420	F. Keffikillite.....	478...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	31, 7...	.....	.....	.....	2.40...	.....	.....
420	G. Melopside.....	478...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	1, 5, 7...	.....	.....	.....	.....	.....	.....
420	H. Achtaragidite.....	478...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	7, 1...	.....	.....	.....	.....	.....	M...
421	Samnite.....	478...	$\text{Al}^2 \text{O}_3, \text{Si}^2 \text{O}_2 + 10 \text{H}...$	1, 7, 5...	.....	.....	4-4.5...	1.7-1.9...	.....	S...
422	Pinite.....	479...	$(\frac{1}{4} \text{H} + \frac{3}{4} (\text{H}^3 \text{R})) \text{Si}^2 \text{O}_2$	7, 1, 4, 8, 3...	59...	.....	2.5-3.5...	2.6-2.85...	E...	A...
422	A. Gumbellite.....	Ap. 1-6	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	4, 1...	31...	.....	Soft...	.....	4...	.....
423	Cataspilite.....	483...	$(\frac{3}{4} \text{R}^3 + \frac{5}{4} \text{Al}) \text{Si}^3 + \frac{3}{4} \text{H}...$	47, 7...	31...	.....	2.5...	.....	E...	P...
423	A. Neulolite.....	482...	$\text{Si O}_2, \text{Al O}_3, \text{H}...$	4, 5...	.....	.....	4.25...	2.476...	.....	.....
423	B.....	482...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	.....	59...	.....	.....	2.66...	E...	M...
424	Biharite.....	483...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	.....	78...	.....	2.5...	2.737...	.....	M...
424	Palagonite.....	483...	$\text{Al Fe Mg Ca Na Si O}...$	5, 4, 8...	72, 78...	.....	4-5...	1.8-2.7...	E...	A...
426	Fahlunite.....	484...	$\text{Al Fe Si O}...$	7, 4...	23...	D...	3.5-5...	2.6-2.8...	E...	.....
427	Groppite.....	486...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	53, 3 to 8, 3	.....	.....	2.5...	2.73...	6...	Cry
428	Voigtite.....	486...	$\text{Al O}_3, \text{Fe O}_3, \text{Fe O Mg Si O}_2, \text{H}...$	35, 4, 5...	31...	M...	2.5...	2.91...	C...	.....
429	Margarodite.....	487...	$\text{Muscovite} + \text{H}...$	1, 7...	31...	L...	2.5...	2.8...	6...	III...
429	A. Gilbertite.....	Ap. 2-24	$\text{R O, R O}_3, \text{Si O}_2, \text{H, Fl}...$	1, 4, 5...	31...	.....	1...	2.75...	6...	M...
430	Damourite.....	487...	$\text{Si O}_2, \text{Al O}_3, \text{Fe O}_3, \text{K O, H}...$	5, 1...	31...	.....	2-3...	2.701...	.....	.....
430	A. Sericite.....	487...	$\text{R O, R O}_3, \text{Si O}_2, \text{H Ti}...$	4, 5, 1...	.....	.....	1...	2.897...	.....	.....
431	Paragonite.....	487...	$(\frac{1}{2} (\text{H}^3, \text{Na}^3) + \frac{1}{2} \text{Al}^2) \text{Si}^2...$	.....	31...	.....	2.5-3...	2.779...	.....	M...
431	A. Ivigtite.....	Ap. 1-7	$\text{Si O}_2, \text{Al O}_3, \text{Fe O}_3, \text{Na O, H}...$	8, 5...	.....	.....	2-2.5...	2.05...	B...	.....
432	Euphyllite.....	488...	$\text{Al O}_3, \text{K O, Na O, Si O}_2, \text{H}...$	1...	31...	L...	3.5...	2.8...	4-4.5...	.....
433	Ellacherite.....	489...	$\text{Ba O K O Mg O Al O}_3, \text{Si O}_2, \text{H}...$	1, 7...	31...	L...	.....	2.9...	.....	.....
434	Cookeite.....	489...	$\text{Al O}_3, \text{Si O}_2, \text{K O, Si O}_2, \text{H, Fl}...$	1...	31...	M...	2.5...	2.7...	D...	.....
435	Hisingerite.....	489...	$(3 \text{R}^3 \text{R O}_3) \text{Si}^2 \text{O}_2 + 4 \text{aq}...$	2, 8...	78 to 72	Z...	3...	3.045...	.....	A...
436	Ekmannite.....	490...	$\text{Fe, Mn O, Mg O, Si O}_2, \text{H}...$	35, 4 to 2...	78...	.....	2.5...	.....	E...	.....
437	Neotocite.....	491...	$(\text{R}^3 \text{O, R O}_3) \text{Si}^2 \text{O}_2...$	2, 21, 8...	66...	.....	3-4...	2.64...	6...	A...
438	Stubelite.....	492...	$\text{R O, R O}_3, \text{Si O}_2, \text{H, Cu O}...$	51, 2...	72...	.....	4-5...	2.223...	.....	.....
439	Gillingite.....	492...	$(\text{R}^3 \text{O, R O}_3) \text{Si}^2 \text{O}_2 + 6 \text{aq}...$	2...	74 to 66	.....	3...	3.045...	E...	A...
440	Jollyte.....	492...	$(\frac{1}{2} (\text{Fe Mg}^3 + \frac{1}{2} \text{Al H})) \text{Si}^3 + 4$	.....	.....	.....	3...	2.61...	D...	A...
441	Epichlorite.....	493...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	66, 35, 4...	78...	.....	2-2.5...	2.76...	6...	F...
442	Polyhydrite.....	493...	$\text{Si Fe, Fe Al, Mn O}...$	61, 8...	66...	.....	2-3...	2.095...	.....	A...
442	B. Hygrophilite.....	Ap. 2-29	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	4, 7, 5...	78...	.....	2-2.5...	2.67...	E...	.....
443	Lillite.....	493...	$\text{R O, R O}_3, \text{Si O}_2, \text{H}...$	.....	.....	.....	2...	3.043...	.....	M...
444	Chlorite-like Mineral.....	493...	$\text{Si O}_2, \text{Al O}_3, \text{Fe O}_3, \text{Fe O, H}$ $(\frac{1}{2} \text{Mg O, Fe O}^3 + \frac{1}{2} (\text{Al}$ $(\text{O}_3, \text{Er O}_3) \text{Si}^2 \text{O}_2 + 3 \text{H} \}$	43 to 37, 4...	31...	M...	3...	2.74...	4...	III...
445	Pyrosclerite.....	493...	$\text{Mg O, Fe O, Al O}_3, \text{Si O}_2, \text{H}...$	8, 5...	31...	M...	1.5...	2.75...	3.5...	VI...
445	A. Vermiculite.....	498...	.....	.....	.....	.....	.....	.....	.....	.....
445	D. Vaalite.....	Ap. 2-58	$\text{R Si} + 2 (3 \text{ Mg, 2 Si, 2 H})...$	.....	.....	.....	.....	.....	.....	IV...
445	C. Hallite.....	Ap. 2-26	$\text{R O, R O}_3...$	.....	.....	.....	.....	.....	.....	VI...
446	Choncritite.....	494...	$\text{Al O}_3, \text{Mg O, Ca O, Si O}_2, \text{H}...$	1, 5...	79...	.....	2.6-3...	2.9...	3.54...	M...
447	Jeffersite.....	494...	$\text{Mg O, Fe O}_3, \text{Al O}_3, \text{Si O}_2, \text{H}...$	8, 5...	31...	M...	1.5...	2.3...	E...	III?
447	A. Kerite.....	Ap. 2-31	$\text{Mg O, Fe O}_3, \text{Al O}_3, \text{Si O}_2, \text{H}...$	4, 5...	31...	M...	1.5...	2.3...	E...	.....
447	B. Macconite.....	Ap. 2-36	$\text{K O, Mg O, Fe O, Al O}_3, \text{Si O}_2, \text{H}...$	21, 8...	31...	M...	2...	2.8...	5.5...	.....
448	Penninite.....	495...	$8 (\text{Mg}^2 \text{O, Al O}_3) 9 \text{ Si O}_2 12 \text{H}...$	4, 7, 3...	31...	L...	2.5...	2.7...	.....	VI...
448	A. Allophite.....	Ap. 2-2	$2 (\text{Al Si}) + 3 (3 \text{ Mg Si}...$	19, 7, 4...	.....	.....	2.5...	2.64...	.....	M...

Species No.	SPECIES.	Page in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
449	Delessite.....	497.	Mg O, Al ₂ O ₃ , Fe O ₃ , Si O ₂ , H.	21, 34, 4.	.....	.....	1-2.5.	2.89.	5.	M.
449	A. Euralite.....	Ap. 1-6	AlO ₃ , Fe O ₃ , FeO, MgO, SiO ₂ , H.	21, 4 to 2.	.....	.....	2.5.	2.62.	5.	.....
450	Ripidolite.....	497.	Mg ²⁺ O, Al O ₃ , Si ³⁺ O ₄ , H ⁴ .	{ shades } { of 4 to 3 }	81, 31.	L.	2.5.	2.7.	6.	IV.
451	Leuchtenbergite.....	500.	($\frac{3}{2}$ Mg ²⁺ + $\frac{2}{3}$ Al) Si + 1 $\frac{1}{2}$ E.	1.	31.	D.	2.5.	2.65.	6.	VI.
452	Prochlorite.....	501.	Al Fe Si H O.	4, 2.	31.	L.	1-2.	2.7-2.9.	6.	VI?
453	Grengeite.....	502.	R O, R O ₃ , Si O ₂ , Cr O ₃ .	6, 8, 4.	.....	M.	.....	.....	.....	Cry
454	Aphrosiderite.....	502.	Fe ³⁺ O, Si O ₂ , AlO ₃ , SiO ₂ + 2 H.	21, 34, 4.	.....	.....	1.	2.8.	.....	.....
454	A. Strigovite.....	Ap. 2-53	R O, R O ₃ , Si O ₂ , H.	21, 4.	.....	.....	1.	3.14.	6.	.....
455	Metachlorite.....	503.	R O, R O ₃ , Si O ₂ , H.	66, 35, 4.	31.	.....	2.5.	.....	.....	.....
455	A. Dumasite.....	503.	.....	54.	.....	D.	soft.	.....	.....	.....
456	Cronstedtite.....	503.	Mn, Mg, Fe, Si, H O.	50, 2.	72.	D.	3.5.	3.35.	E.	VI.
456	A. Sideroschistolite.....	504.	Fe ₄ O, Si O ₂ + 1 $\frac{1}{2}$ H.	50, 2.	4.	D.W.	3-4.	2.5.	E.	VI.
457	Corundophilite.....	504.	($\frac{1}{2}$ R ³⁺ + $\frac{1}{2}$ Al) 4Si ³⁺ + 5 H.	34, 4, 35, 4.	.....	.....	2.5.	2.90.	.....	IV.
458	Chloritoid.....	504.	Al Fe Mg Si H O.	7, 4, 2.	72.	D.	5-6.	3.5-3.6.	6.	IV.
458	A. Phyllite.....	506.	R O, R O ₃ , Si O ₂ , H, Mn.	2, 7, 4.	7.	L.	5-5.5.	4.4.	.....	.....
458	B. Guadalcazarite.....	Ap. 2-15	6 Hg S + Zn S.	13, 2.	.....	S.	2.	7.15.	E.	M.
459	Margarite.....	509.	Al O ₃ , Ca O, Na O, Si O ₂ , H.	1, 3, 7.	31.	M.	4.	2.99.	1-4.5.	III.
459	A. Dudleyite.....	Ap. 2-17	NaO, MgO, FeO ₃ , AlO ₃ , SiO ₂ , H.	15.	31.	M.	.....	.....	.....	.....
459	B. Willcoxite.....	Ap. 2-61	K, Na, Mg, Fe, Al, Si, H.	7.	31.	M.	1.5.	.....	.....	.....
460	Thuringite.....	407.	Al Fe Si H O.	34, 4, 39, 4.	74 to 66.	K.	2.5.	3.186.	3.	M.
461	Seybertite.....	508.	Al, Fe, Mg, Ca, Si, H.	5, 3, 8.	31.	L.	4.5.	5.1.	.....	III.
462	Wolchonskoite.....	509.	er, Al, Fe, Mg, Si, H.	6, 38, 4.	66.	.....	2-2.5.	2.3.	.....	A.
463	Selwynite.....	509.	SiO ₂ , AlO ₃ , CrO ₃ , Mg, H.	37, 4.	.....	H.	3.5.	2.53.	6.	M.
464	Chrome Ochre.....	510.	Si O ₂ (AlO ₃ , CrO ₃ , FeO ₃) ²	4.	.....	.....	2.	.....	.....	.....
465	Miloschite.....	510.	(AlO ₃ , CrO ₃) SiO ₂ + 3 H.	6, 4.	.....	.....	1.5.	2.13.	.....	C.
466	Pimelite.....	510.	Si, Al, Fe, Ni, Mg, H.	33, 4.	78.	.....	2.5.	2.23-2.3.	.....	M.
467	Chlorophæite.....	510.	Fe O, Si O ₂ + 6 H?	21, 4, 34, 4.	.....	.....	1.5-2.	2.02.	E.	G M
468	Klipsteinite.....	511.	Mn O ₃ , Mn O, Si O ₂ , H.	21, 61, 8 to 2	66 to sub 73.	.....	.....	.....	E.	A C
469	Chamoisite.....	511.	Si O ₃ , Al O ₃ , Fe O, H.	4, 7 to 2.	.....	.....	3.	3-3.4.	E.	.....
470	Alvite.....	511.	Si, Al, Be, Fe, Zr, Th C.	3, 8.	78.	.....	5.5.	2.601.	.....	IL
470	A. Picrofluite.....	512.	Si O ₂ , Mg O, Ca O, H Fe.	1, 5, 6.	78 to 66.	.....	2.5.	2.74.	E.	A
471	Pyrochlore.....	512.	Ca O, Ce O, Cb O ₃ .	8, 3.	72.	.....	5.5.	4.3.	.....	I.
471	A. Koppite.....	Ap. 2-32	5 R O, 2 Cb O ₃ .	8.	.....	.....	.....	.....	.....	.....
472	Microilite.....	513.	Cb O ₃ , Ca O, W O ₃ , Y O, U O ₂ .	8, 5.	72, 70.	.....	5.5.	4.485-5.562.	.....	I.
473	Tantalite.....	514.	Fe O, Mn O, Ta O ₅ , Sn O ₂ .	2.	2, 8.	F.	6-6.5.	7-8.	.....	III.
474	Columbite.....	515.	FeO, MnO, CbO ₃ , TaO ₅ , SnO ₂ .	2.	3, 2.	F.	6.	5.4-6.5.	.....	III.
475	Tapiolite.....	518.	Fe ²⁺ O, Ta ⁵⁺ O ₅ .	2.	71, 73.	not et., C.	.....	6-7.35.	.....	II.
476	Hielmite.....	519.	Ta, Sn, W, Fe, U, Y.	2.	73.	not et.	5.	5.82.	.....	M.
477	Yttrrotantalite.....	519.	Ca, Y, Fe, Ta, W.	5 to 2.	7.	Z.	5.5.	5.7.	.....	III.
478	Samarskite.....	520.	Cb O ₃ , Fe O, U O ₃ , Y O.	20, 2.	21, 3.	.....	5.5-6.	5.6.	4.5.	III.
478	A. Nohelite.....	Ap. 2-41	R ³⁺ Cb O ₃ + 1 $\frac{1}{2}$ H.	2, 8.	.....	H.	4.5-5.0.	5.04.	E.	M.
479	Euxenite.....	521.	Y, U, Ce, Ti, Cb, Ta O.	8, 2.	75, 74.	.....	6.5.	4.9.	.....	III.
480	Aeschnyrite.....	522.	Zr, Fe, Ce, Y, Cb, Ti O.	2.	70.	.....	5.6.	5.1.	.....	III.
481	Polycrase.....	523.	Fe, Ce, Y, Zr, Ti, Cb O.	2.	sub. 73.	.....	5.5-6.5.	4.8-5.1.	.....	III.
482	Polymignite.....	523.	.....	.....	.....	.....	.....	.....	.....	III.
483	Fergusonite.....	524.	Y O, Fe O, U O, Cb O ₃ .	2.	19, 8.	Z.	5.5-6.	5.8.	.....	IL.
484	Adopholite.....	525.	Cb O ₃ , Fe O, Mn O.	8, 5, 2.	1.	.....	3.5-4.5.	3.8.	.....	IL.
485	Mengite.....	525.	Zr O ₃ , Fe O ₃ , Ti O ₂ .	13, 2.	81, 8.	.....	5.5-5.5.	5.48.	.....	III.
486	Rutherfordite.....	526.	Ti O ₂ , Ce O.	8, 2.	5, 8.	Z, F.	5.5.	5.58.	.....	IV.
490	Xenotime.....	527.	(Y O, Ca O) ³ P O ₅ .	5, 8, 3.	70.	E.	4-5.	4.5.	.....	IL.
490	Osteolite, (Copolites)	533.	P O ₃ , Ca O, Si O ₂ , H.	1, 7.	.....	.....	1-2.	2.8-3.1.	.....	M.
490	B. Phosphate Nodules	534.	P O ₂ , Ca O, C O, Mg O, Fe O ₃ .	8, 2.	.....	.....	2.5.	2.313.	.....	.....
490	C. Staffelite.....	534.	Ca O, 3P O ₅ , Ca O, CO ₂ .	35, 4 to 4.5.	.....	.....	4.	3.13.	.....	S.
490	D. Guano.....	535.	P O ₃ , Ca O, CO ₂ .	7, 1, 5, 8.	.....	.....	.....	.....	.....	.....
490	E. Epiphosphorite.....	535.	P O ₃ , Ca O, Fe O ₃ , Al O ₃ , Si O ₂ .	5.	.....	.....	4.5-4.	3.125.	.....	.....
490	F. Talc-Apatite.....	535.	3 CaO 3P O ₅ + Mg ²⁺ O P O ₅ .	61, 1.	56, 77.	.....	5.	2.7-2.75.	.....	.....
490	G. Hydroapatite.....	535.	3 Ca ²⁺ O P O ₅ + Ca F + H.	61, 1.	.....	.....	5.5.	3.10.	.....	.....
491	Cryptolite.....	529.	Ce ³⁺ O P O ₅ .	5-23.	.....	.....	.....	4.6.	.....	.....
492	Apatite.....	530.	Ce ³⁺ O P O ₅ + 1 Ca (Cl F).	54, 4, 6, 5, 3, 1.	72.	.....	5.	2.9-3.2.	4.5-5.	VI.
493	Pyromorphite.....	535.	3 Pb ²⁺ O + Pb Cl.	1, 8, 3.	70.	F.	3.5-4.	5.5-7.1.	1.5.	VI.
494	Mimetite.....	537.	3 Pb ²⁺ O As O ₅ + Pb Cl.	5, 8.	70.	.....	3.5.	7.1.	.....	VI.
495	Wagnerite.....	538.	2 Mg ²⁺ O P O ₅ + (Mg, Na) Fl.	5.	72.	.....	5.5.	3.07.	3.5.	IV.
498	Monazite.....	539.	Ce O, La O, Di O, Th O ₂ , P O ₅ .	5, 6, 3, 8.	70.	D.	5-5.5.	5.2.	.....	IV.
497	Turnerite.....	540.	Ce O, La O, Di O, Th O ₂ , P O ₅ .	5, 6, 3, 8.	71, 7.	.....	4.	3.34.	1.5.	IV.
498	Triphylite.....	541.	(Fe O, Mn O, Li O) ³ P O ₅ .	4 to 7, 6.	70.	W.	5.	3.7.	.....	IV?
499	Sarcopside.....	Ap. 1-14	Mn O, Fe O, Li O, P O ₅ .	48, 3 to 49, 6.	79.	.....	4.	3.6.	1.5.	IV?
499	Triplite.....	543.	R ³⁺ O ₂ P O ₅ - R Fl.	8, 2.	70.	in 3.	5.	3.6.	.....	.....
500	Hopelite.....	544.	P O ₃ , Zn O, Cd O.	7, 1, 3, 8.	72, 1.	W.	2.5-3.	2.76-2.85.	4.5.	III.
501	Berzellite.....	544.	(CaO, MgO, MnO) ¹⁰ As ³⁺ O ₅	22, 1 or 45, 5.	59.	F.	5-6.	2.52.	.....	M.
502	Carminite.....	545.	($\frac{1}{2}$ Li, Na) ³ + $\frac{1}{2}$ Al ⁴ P.	54, 4, 1, 78, 1.	31, 72.	W.	6.	3-3.11.	E.	III.
503	Amblygonite.....	545.	(A little Fl. - ($\frac{1}{2}$ Li O)	.....	.....	Clev. at	.....	.....	.....	.....
503	A. Durangite.....	Ap. 1-4	(Na O) ³ + $\frac{1}{2}$ Al O ₃ P O ₅ .	4, 7, 1.	72.	105, 9.	6.	3.11.	2.	V.
503	B. Hebronnite.....	Ap. 2-27	Na Al Fe Mn Si Fl As O ₅ .	56, 3.	72.	E.	5.	3.4.	2.	IV.
504	Herderrite.....	546.	Na Al Fe Mn Si Fl As O ₅ .	7, 1.	72.	Cl. at 105.	6.	3.04.	.....	.....
			(Pb O, Fe O, Mn O)	5, 4, 1.	72, 1.	Z. F.	5.	2.985.	5.	III.
505	Monimolite.....	546.	(Ca O, Mg O, Fe O, Mn O)	.....	70.	C.	4.5-5.	5.94.	E.	II.
506	Romeite.....	547.	R ³⁺ O, Sb O ₃ , Sb O ₅ .	45, 5.	.....	.....	5.5.	4.714.	E.	IL.

Species No.	SPECIES.	Page in Dresser	COMPOSITION.	Color.	Streak or Luster	Cleavage or Fracture	Hardness.	Specific Gravity	Fusibility.	Crystaliza- tion.
507	Ammitolite.....	547...	Hg Cu Fe S Sb O ₃	21, 3.....					S.....	
507	A. Rivotite.....	Ap. 2-48	Sb ₂ O ₃ + 4 { Cu O } C O ₂	5, 4 to 7, 4.....	7, 4.....	H.....	3.5-4.....	3.55.....	E.....	A.....
508	Arsenate of Nickel.....	548...	Ni ₂ O As O ₃	38, 4, 8.....			4.....	4.838.....	M.....	
509	Arsenate of Nickel.....	548...	Ni ₂ O As O ₃	24, 5.....			4.....	4.982.....	A.....	
510	Nadorite.....	Ap. 1-11	Sb, Pb, O, Cl.....	8, 5.....	70.....		3.....		S. E.....	III.....
515	Stercorite.....	551...	NaO N H 4 O P O ₃ + 9 H.....	1, 8, 5.....	72.....			1.6151.....	E.....	M.....
516	Struvite.....	551...	(N H ₄ O, Mg O) ² P O ₃ + 12 H.....	5 to 8, 1.....	72.....	D.....	2.....	1.7.....	E.....	III.....
517	Haidingerite.....	552...	{ Ca O } + 1 H ² P O ₃ + 3 H.....	1.....	72, 1.....		1.5-2.5.....	2.848.....	E.....	III.....
518	Brushite.....	552...	{ Ca O } + 1 H ² P O ₃ + 3 H.....	5, 1.....	31, 72.....	W.....	2-2.5.....	2.21.....	E.....	IV.....
519	A. Kollophan.....	Ap. 1-9	P O ₃ Ca O, H, C O ₂				5.....	2.70.....		
519	Metabrushite.....	553...	{ Ca O } + 1 H ² P O ₃ + 3 H.....	19, 5.....	F.....		2.5-3.....	2.288.....	E.....	IV.....
520	Pharmacolite.....	554...	Ca ² O As O ₃ + 6 H.....	1, 7.....	72.....		2-2.5.....	2.7.....	E.....	IV.....
520	A. Picropharmacolite.....	555...	(Ca O, Mg O) ² As O ₃ + 12 H.....						E.....	IV.....
520	B. Isoclasite.....	Ap. 1-7	Ca ² O P O ₃ + Ca O H + 4 H.....	61, 1.....	31, 72.....	W.....	1.5.....	2.92.....	E.....	IV.....
520	C. Waplerite.....	Ap. 2-60	2 Ca O As O ₃ + 8 H.....		72.....		2-2.5.....	2.48.....	E.....	V.....
521	Churchite.....	555...	{ 2 Ce O } + { 2 Ca O } P O ₃ + 4 H.....	19, 7.....	72.....	Z.....	3.....	3.14.....		VI.....
522	Hoernesite.....	556...	Mg ² O As O ₃ + 8 H.....	60, 1.....			0.5.....	2.474.....	E.....	IV.....
523	Roesslerite.....	556...	(3 Mg O - 1 H ² P O ₃) As O ₃ + 12 H.....	23, 1.....	72 to 66.....		2-3.....	?	E.....	
524	A. Bobierite.....	795...	Mg ² O P O ₃ with H ₂ O.....	{ Different }					E.....	IV.....
524	Vivianite.....	556...	F ² O P O ₃ + 8 H.....	{ sh ² as 06 }	31, 72.....	W.....	1.5-2.....	2.6.....	1.5.....	IV.....
525	Simplexite.....	558...	Fe O, As O ₃	19, 41, 4.....	5, 1.....	W.....	2.5.....	2.957.....		IV.....
526	Erythrite.....	558...	Co ² O As O ₃ + 8 H.....	21, 3, 42, 3.....	31.....	E.....	1.5-2.5.....	2.94.....	2.....	IV.....
526	A. Roselite.....	560...	R ₃ O As ₂ O ₃ + 3 H.....	53, 3.....	72.....	ct.....				III.....
526	B. Lavendulan.....	560...	As O ₃ Co O, Ni O, Cu O.....	49, 6.....			2.5-3.....	3.014.....	E.....	A.....
526	C. Winklerite.....	Ap. 2-61	As O ₃ Ni Cu Co As O ₂ H.....	6, 2.....	8.....	Z.....	3.....	3.432.....		M.....
527	Annabergite.....	560...	Ni ² As O ₃ + 8 H.....	43, 4.....	77.....		soft.....		E.....	IV.....
528	Hydrous Bibasic Arsenate of Nickel and Cobalt.....	560...	(Ni O Co O) ² As O ₃ + 8 H.....	7, 1.....	66 to 79, 70.....		2.5.....	3.086.....		D.....
529	Cabrerite.....	561...	R ³ O As O ₃ + 8 H.....	43, 4.....	31.....	W, C.....	2.....	2.96.....		I.....
530	Köttigite.....	561...	(Zn O Co O Ni O) ² As O ₃ + 8 H.....			W.....	2.5-3.....		E.....	IV.....
531	Hureaulite.....	561...	(Mn O, Fe O) ² P O ₃ + 5 H.....	56 to 3, 5.....	72.....		5.....	3.2.....	E.....	IV.....
532	Chondrodarsenite.....	562...	Mn ² O As O ₃ + 2 H.....	5, 3.....			3.....		E.....	G.....
533	Trichalcite.....	562...	Cu ² O As O ₃ + 5 H.....	36, 4.....	79.....		2.5.....		F.....	
534	Thrombolite.....	562...	Cu O, H, P O ₃	37, 35, 4.....	72.....		3-4.....	3.38.....	E.....	A.....
535	Libethenite.....	563...	Cu ² O P O ₃ + Cu O H.....	21, 34, 5.....	70.....	Z, H, F.....	4.....	3.7.....	2.....	III.....
536	Olivenite.....	564...	Cu ² As O ₃ (P O ₃) + Cu O H.....	34, 35, 2 to 4.....			4.5.....	3.93(?).....		III.....
537	Adamite.....	565...	Cu ² O As O ₃ + Zn O H.....	58 to 45, 5.....	72.....	ct.....	3.5.....	4.34.....		III.....
538	Conicalchalcite.....	565...	Cu O Ca O P O ₃ As O ₃ V O ² H.....	39 to 37, 4.....			4.5.....	4.12.....		M.....
539	Baydonite.....	565...	(Pb O, Cu O) ² As O ₃ + 2 H.....	38 to 2, 4.....			4.5.....	5.35.....		M.....
540	Euchroite.....	566...	Cu ² O As O ₃ + Cu O H + 6 H.....	35 to 37, 4.....	72.....	E.....	3.5-4.....	3.39.....	2.....	III.....
541	Tagilite.....	566...	Cu ₂ P O ₃ + Cu O H + 2 H.....	36 to 37, 4.....			3.....	3.5(?).....	F.....	IV.....
541	A. Veszelyite.....	Ap. 2-59	4 Cu O P O ₃ + 5 H.....				4.....	3.5.....		V.....
542	Liroconite.....	567...	Cu O, Al O ₃ As O ₃ P O ₃ H.....	40, 6 to 4.....	72.....		2-2.5.....	2.9.....	E.....	IV.....
543	Pseudomalachite.....	568...	Cu ² O P O ₃ + 2 Cu O H + H.....	21, 4.....	72.....		4.5-5.....	4.2.....	2.....	III.....
544	Erynite.....	569...	Cu ² O As O ₃ + 2 Cu O H.....	38 to 37, 4.....	60.....		4.5.....	4.04.....	E.....	
545	Cornwallite.....	569...	Cu ² O As O ₃ + 2 Cu O H + 3 H.....	37 to 36, 4.....		Am.....	4.5.....	1.16.....		A.....
546	Tyrolite.....	570...	Cu ² O As O ₃ + 2 Cu O H + 7 H.....	43, 39, 4.....		D.....	1-2.....	3.06.....	E.....	III.....
547	Chinochalcite.....	570...	Cu ² O As O ₃ + 3 Cu O H.....	21, 6, 4.....	31 to 72.....	D.....	2.5-3.....	4.19-4.36.....	2.....	VI.....
548	Chalcophyllite.....	571...	Cu ² As O ₃ + 5 Cu O H + 7 H.....	37, 38, 4.....	31.....	D.....	2.....	2.5.....		VI.....
549	Berlinite.....	571...	Al O ₃ P O ₃ + 1/2 H.....	1, 7, 3.....	72.....		6.....	2.04.....		M.....
550	Callinitite.....	572...	Al O ₃	43, 37, 4.....			3.5-4.....	2.50-2.52.....		M.....
550	A. Zepharovichite.....	Ap. 1-17	Al O ₃ P O ₃ + 6 H.....	4, 5, 7, 1.....	72.....		5.....	2.3.....		C.....
551	Lazulite.....	572...	Al O ₃ P O ₃ + (Mg O, Fe O) H.....	33, 6.....	72.....		5-6.....	3.1.....		IV.....
552	Barrandite.....	574...	{ 2 Fe } + { 2 Al } P + 4 H.....	19, 6, 8, 4.....	72.....	Cry.....	4.5.....	2.576.....		I.....
553	Scorodite.....	574...	Fe O ₃ As O ₃ + 4 H.....	35, 4 to 8.....			3.5-4.....	3.2.....	2.....	III.....
554	Wavellite.....	575...	Al O ₃ P ² O ₃ + 12 H with Fl.....	1, 5, 7, 8, 6, 4.....	31.....	rad.....	3.5-4.....	2.3.....		III.....
554	A. Kapnickite.....	576...	Al O ₃ P O ₃			U.....	3.5-4.....	2.56.....		
554	B. Planerite.....	576...	(Al O ₃ + 9 H) + 3/2 Cu Fe H.....	36, 4.....			5.....	2.65.....		
554	C. Cenerioclactite.....	Ap. 1-3	Al O ₃ P O ₃ + 10 H.....	641 to 6.....	72.....	H.....	5.....	2.5.....		
555	Trollite.....	577...	Al O ₃ P O ₃ + 1/2 Al O ₃ H ²	19, 4.....	72.....		5.5.....	3.10.....		C.....
556	Plumbogummite.....	577...	Al O ₃ Pb O, P O ₃ H.....	1, 3 to 5, 7, 4.....	70.....		4-5.....	4.8.....		D.....
557	Calcioferite.....	578...	P O ₃ Fe O ₃ Ca O, H.....	24, 5, 4, 5.....	31.....	W, F.....	2.5.....	2.62-2.529.....	E.....	IV.....
558	Pharmacosiderite.....	578...	{ 3 Fe O ₃ As O ₃ + Fe O ₃ } + 12 H.....	4, 3, 8, 5.....		A.....	2.5.....	3.....		I.....
559	Cirrolite.....	579...	Al O ₃ P O ₃ + 2 Ca ² P O ₃ + 3 H.....	19, 5.....			5-6.....	3.08.....		C.....
560	Childrenite.....	579...	Al O ₃ Fe O ₃ Mn O P O ₃ H.....	5, 8 to 8, 2.....	72.....		4.5-5.....	3.18.....		F.....
561	Attacolite.....	580...	P O ₃ Al O ₃ Fe Mn Ca H.....	19, 3.....		D.....	5.....	3.19.....		M.....
562	Angelite.....	580...	Al ² O ₃ P O ₃ + 3 H.....	23, 19, 3.....	31.....	ct.....	6.....	2.77.....		M.....
563	Turquois.....	580...	Al O ₃ Cu O, P O ₃ H.....	40, 6 to 4.....			6.....	2.6-2.8.....		III.....
564	Pegunite.....	582...	Al ² O ₃ P O ₃ + 6 H.....	21, 4, 7, 1.....	72.....		3-3.5.....	2.5.....		III.....
565	Fischerite.....	582...	Al ² O ₃ P O ₃ + 8 H.....	38 to 34, 4.....	72.....		5.....	2.46.....		
565	A. Variscite.....	582...	{ 3 Fe O ₃ As O ₃ + Fe O ₃ } + 3 H.....	43, 4.....	1, 74, 78.....					
566	Tavistockite.....	582...	(1/2 Ca ² O + 1/2 Al O ₃) ² P O ₃		31.....					M.....
567	Chenevixite.....	583...	(Fe O ₃ Cu ² O) ² As O ₃ + 3 H.....	21, 4.....			4.5.....	3.93(?).....		E.....
568	Dufrenoyite.....	583...	Fe ² O ₃ P O ₃ + 3 H.....	21, 35, 4.....	79.....	rad.....	3.5-4.....	3.3.....		III.....
569	Coxonite.....	584...	Fe ² O ₃ P O ₃ + 12 H (with Fl).....	8, 5.....	79.....	U, rad.....	3-4.....	3.38.....		E.....
570	Arsenosiderite.....	584...	Ca O, Fe O ₃ As O ₃ H.....	8, 5.....	79.....		1-2.....	3.8.....		M.....
571	Evansite.....	585...	Al ² O ₃ P O ₃ + Al O ₃ H ² + 15 H.....	1.....	72.....		3.5-4.....	1.94.....		M.....
572	Torbernite.....	585...	Ca O ₂ P O ₃ + Cu O H + 7 H.....	38, 35 to 37, 4.....	31.....	Mi.....	2-2.5.....	3.5.....	2-5.....	II.....
572	A. Zeunerite.....	Ap. 2-62	Cu O, 2 U O ₂ As O ₃ + 8 H.....	5, 8, 43, 4.....	31.....	D, W.....	2.5.....	3.2.....		II.....

Species No.	SPECIES.	Page in Dana.	COMPOSITION.	Color.	Streak or Luster.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
573	Antunite.....	586...	$U^2O_3 \cdot P_2O_5 \cdot CaO \cdot H$	20 to 24, 5.	31.....	D.....	2-2.5.....	3.1.....	2.5.....	III.
573	A. Walpurgite.....	Ap. 1-16	$B_2O_3 \cdot UO_2 \cdot As_2O_3 \cdot H$	59, 5.	71.....	T.....	5.8.....	3.3.....	IV.	IV.
573	B. Trögerite.....	Ap. 1-16	$U^2O_3 \cdot As_2O_3 \cdot 2O \cdot H$	26, 5.	70.....	Tr.....	3.3.....	3.3.....	IV.	IV.
573	C. Uranospinitite.....	Ap. 2-58	$CaO, UO_2, As_2O_3 \cdot 8H$	4.....	.....	W.....	2.3.....	3.45.....	.....	III.
574	Amphithalite.....	587...	$Al_2O_3 \cdot CaO \cdot P_2O_5 \cdot H$	64, 1.	.....	.....	6.....	.....	.....	M.
574	A. Hydrous Phosphate of Alumina and Lime.....	587...	$P_2O_5 \cdot Al_2O_3 \cdot CaO \cdot H$	21, 57, 3.	.....	.....	.....	3.194.....	.....	C.
574	B. Cupreous Phosphate of Alumina.....	587...	$P_2O_5 \cdot SiO_2 \cdot Al_2O_3 \cdot CuO \cdot NaH$	19, 6.	.....	.....	Soft.....	.....	.....	C.
575	Sphaerite.....	587...	$Al_2O_3 \cdot P_2O_5 \cdot 10H$	7, 3.	73.....	.....	4.....	2.53.....	.....	.....
576	Borickite.....	588...	$(FeO_3 \cdot CaO) \cdot P_2O_5 \cdot 15H$	3, 8.	59.....	.....	3.5.....	2.7.....	E.....	M.
577	Rhagite.....	Ap. 2-48	$Bi_2O_3 \cdot As_2O_3 \cdot H_2O$	32 H. 3, 4, 59.	59.....	.....	5.....	0.82.....	E.....	.....
580	Diadochite.....	588...	$Fe_2O_3 \cdot P_2O_5 \cdot 2FeO \cdot SO_3$	3, 5, 8.	70.....	.....	5.....	2.08.....	E.....	S.
581	Pitticite.....	589...	$FeO_3 \cdot As_2O_3 \cdot SO_3 \cdot H$	5 to 3, 8.	72.....	.....	2-3.....	2.2-2.5.....	E.....	M.
582	Beudantite.....	589...	$P_2O_5 \cdot H \cdot AsO_3 \cdot SO_3 \cdot FeO \cdot PbO$	21, 34, 4, 2, 8.	72.....	D.....	3.5-4.5.....	4-4.3.....	F.....	VI.
583	Lindackerite.....	590...	$2Cu^2AsO_5 \cdot NiO \cdot SO_3 \cdot 7H$	30 to 43, 4.	72, 19, 1.	.....	2-2.5.....	.....	E.....	III.
584	Svanbergite.....	590...	$Al_2O_3 \cdot CaO \cdot NaO \cdot P_2O_5 \cdot SO_3 \cdot H$	5 to 5, 8.	72.....	.....	5.....	3.3.....	6.....	VI.
585	Ficinitite.....	590...	$P_2O_5 \cdot SO_3 \cdot FeO \cdot MnO \cdot H$	2.....	59, 31.	.....	5-5.5.....	3.4-5.53.....	E.....	IV.
586	Bindheimite.....	591...	$Pb^2O \cdot Sb^2O_3 \cdot 4H$	8, 5.	70.....	F.....	4.....	4.7.....	E.....	A.
587	Stibioferite.....	Ap. 2-53	$FeO_3 \cdot Sb^2O_3 \cdot H$	5.....	70.....	.....	4.....	3.52.....	E.....	II.
590	Nitre.....	592...	$KO \cdot NO_3$	1.....	72.....	.....	2.....	1.93.....	E.....	III.
591	Soda nitre.....	593...	$NaO \cdot NO_3$	1.....	72.....	.....	1.5-2.....	2.2.....	E.....	VI.
592	Nitrocalcite.....	593...	$CaO \cdot NO_3 \cdot H$	1, 7.	.....	.....	.....	.....	F.....	M.
593	Nitromagnesite.....	593...	$MgO \cdot NO_3$	1.....	.....	.....	.....	.....	.....	.....
594	Sassolite.....	594...	$B_2O_3 \cdot 3H_2O$	5 to 1.....	31.....	T.....	1.....	1.48.....	1.....	V.
595	Saibelyite.....	594...	$3MgO \cdot 5B_2O_3 \cdot 4H$	1, 5.....	.....	.....	3-4.....	3.....	E.....	.....
595	A. Susselite.....	Ap. 1-15	$(MnO \cdot MgO) \cdot 2PbO \cdot H$	7, 1.....	79.....	U.....	3.....	3.42.....	2.....	.....
595	A. Ludwigite.....	Ap. 2-35	$2MgO \cdot B_2O_3 \cdot FeO \cdot FeO_3$	5, 4, 6.....	21, 4.....	K.U.....	5.....	3.9-4.....	F.M.....	.....
596	Hydroboracite.....	595...	$3CaO \cdot 4B_2O_3 \cdot 3MgO \cdot 4BO_3 \cdot 18H$	1.....	.....	.....	2.....	1.9-2.....	E.....	F.
597	Boracite.....	595...	$3MgO \cdot 4B_2O_3 \cdot 4MgCl$	1, 7, 4.....	.....	72.....	4-5-7.....	2.97.....	2.....	I.
597	A. Huysenite.....	799...	$(\frac{1}{2}MgO + \frac{1}{2}FeO) \cdot 4B_2O_3 \cdot 4H$	4, 7, 5.....	76.....	.....	.....	2.78.....	.....	M.
598	Rhodizite.....	596...	$CaNa \cdot 2B_2O_3 \cdot H$	7 H. 1.....	72.....	.....	8.....	3.3-4.....	6.....	I.
598	A. Lüneburgite.....	Ap. 1-10	$2(MgO \cdot H) \cdot P_2O_5 \cdot MgO \cdot BO_3$.....	.....	.....	.....	.....	.....	.....	.....
599	Borax.....	597...	$NaO \cdot 2B_2O_3 \cdot 10H$	7, 1.....	72.....	.....	2.5.....	1.72.....	E.....	IV.
600	Bechilite.....	597...	$(\frac{1}{2}CaO + \frac{1}{2}H) \cdot BO_3 \cdot 1\frac{1}{2}H$.....	.....	.....	.....	.....	.....	.....	.....
600	A. Priceite.....	Ap. 2-45	$3CaO \cdot 4B_2O_3 \cdot 6H$	1, 64.....	.....	.....	2.26-2.29.....	3.....	C.....	.....
601	Howlite.....	598...	$CaO \cdot B_2O_3 \cdot SiO_2 \cdot H$	1.....	sub. 72.....	.....	3.5.....	2.55.....	F.....	C.
601	A. Winkworthite.....	Ap. 1-17	Mixture $B_2O_3 \cdot H$	1.....	.....	.....	2-3.....	.....	.....	.....
602	Ulexite.....	599...	$NaO \cdot CaO \cdot B_2O_3 \cdot H$	1.....	79.....	U.....	1.....	1.65.....	1.....	F.M.
603	Cryptomorphite.....	599...	$(\frac{1}{2}(NaO \cdot CaO) - \frac{1}{2}H) \cdot BO_3$	1.....	.....	P.....	1.....	.....	1.....	.....
604	Larderellite.....	600...	$NH_4 \cdot 4B_2O_3 \cdot 4H$	1.....	.....	.....	.....	.....	.....	F.....
605	Lagonite.....	600...	$FeO_3 \cdot 3B_2O_3 \cdot 3H$	5.....	.....	.....	.....	.....	.....	.....
606	Warwickite.....	600...	$MgO \cdot FeO \cdot TiO_2 \cdot B_2O_3$	8, 2.....	sub. 73.....	E.....	3-4.....	3.4.....	IV.....	.....
610	Wolframite.....	601...	$(MnO \cdot FeO) \cdot WO_3$	2.....	.....	E.....	5.5.....	7.3.....	3.....	III.
611	Hübnerite.....	603...	$MnO \cdot WO_3$	8, 3.....	71.....	E.....	4.5.....	7.1.....	E.....	III.
612	Ferberite.....	604...	$(FeO \cdot MnO) \cdot WO_3$	2.....	.....	E.....	5.5.....	7.3.....	3.....	M.
613	Megabasite.....	604...	$(MnO \cdot FeO) \cdot WO_3$	8.....	sub. 73.....	E.....	3.5-4.....	6.4-6.9.....	E.....	III.
614	Scheelite.....	605...	$CaO \cdot WO_3$	1, 8, 4, 3.....	72.....	.....	4.5-5.....	6.....	5.....	II.
615	Cuproscheelite.....	606...	$CuO \cdot WO_3 + 2CaO \cdot WO_3$	39, 4 to 34, 35.	72.....	ct.....	4.5-5.....	.....	F.....	G.
615	A. Cuprotungstite.....	Ap. 2-14	$CuO \cdot 3WO_3$	5, 4.....	75, 4, 5.....	.....	4.....	.....	E.....	A.
616	Stolzite.....	606...	$PbO \cdot WO_3$	8, 5 to 3.....	70.....	.....	3.....	7.9.....	2.....	II.
617	Wulfenite.....	607...	$PbO \cdot MoO_3$	1, 3 gen'lly 5.....	70.....	B.....	3.....	6.9.....	1.5.....	II.
617	A. Eosite.....	Ap. 1-5	$PbO \cdot MoO_3 \cdot PbO$	21, 3.....	8, 5.....	.....	3-4.....	.....	.....	II.
618	Patraite.....	608...	$CoO \cdot MoO_3$	2.....	.....	.....	.....	.....	F.....	A.
619	Dechenite.....	609...	$(PbO \cdot ZnO) \cdot VO_3$	5.....	78.....	.....	3-4.....	5.7.....	E.....	M.
620	Desclouzeite.....	609...	$Pb^2O_2 \cdot VO_3$	34, 8 to 2.....	70.....	.....	3.5.....	5.8.....	E.....	III.
621	Vanadinite.....	610...	$3PbO \cdot V_2O_5 - \frac{1}{2}PbCl$	8 or 5.....	70.....	.....	2.7-3.....	6.8.....	VI.....	.....
622	Volborthite.....	611...	$CuO \cdot V_2O_5 \cdot H$	34, 4 to 26, 5.....	31.....	D.....	3-3.5.....	3.5.....	E.....	VI.
622	A. Vanadate of Lime &.....	612...	$(CuO \cdot CaO) \cdot V_2O_5 - aq.$ $(3R_2O \cdot SiO_2 + Ca_2(V))$ $(O_4 + 2V_2O_5) \cdot f$ $(Pb^2O \cdot V_2O_5 + Cu^2O \cdot V_2O_5)$	21, 4.....	7, 4.....	72, 75.....	.....	3.96.....	.....	F.....
622	B. Vanadilite.....	Ap. 1-16	.....	21, 8, 2.....	.....	.....	.....	.....	E.....	.....
623	A. Vanadate from the Lake Superior Copper Regions.....	612...	$V_2O_5 \cdot FeO_3$ &c.....	21, 8 or 3, 5.....	.....	.....	.....	.....	.....	.....
624	Pucherite.....	Ap. 1-12	$Bi_2O_3 \cdot V_2O_5$	3, 8.....	72, 71.....	D.....	4.....	5.91.....	E.....	III.
624	A. Uranospherite.....	Ap. 2-57	$Bi_2O_3 \cdot 2UO_3 + 3H$	5.....	5.....	Rad.....	2.3.....	6.30.....	.....	.....
625	Sulphate.....	614...	H_2SO_4	23.....	.....	Liquid.....	1.85.....	.....	.....	C.
626	Taylorite.....	614...	$(\frac{2}{3}K_2O + \frac{1}{3}NH_4O) \cdot SO_3$	5, 1.....	.....	Cry.....	2.....	.....	D.....	C.
627	Aphthalite.....	615...	$K_2O \cdot SO_3$	1.....	72.....	.....	3.....	1.73.....	E.....	III.
628	Misenite.....	615...	$K_2O \cdot SO_3 - H \cdot SO_3$	1.....	.....	.....	2-3.....	2.55.....	E.....	III.
629	Thénardite.....	615...	$Na_2O \cdot SO_3$	1.....	72.....	.....	2-3.....	2.55.....	E.....	III.
630	Barite.....	616...	$BaO \cdot SO_3$	1, 5, 6.....	72.....	D.W.....	2.5-3.5.....	4.5.....	3.....	III.
631	Celestite.....	619...	$SrO \cdot SO_3$	23, 1, 6.....	72.....	D.W.....	3-3.5.....	3.9.....	3.....	III.
632	Anhydrite.....	621...	$CaO \cdot SO_3$	1, 7, 57, 3.....	31, 72.....	H.....	3-3.5.....	2.899.....	F.....	III.
633	Anglesite.....	622...	$PbO \cdot SO_3$	1.....	71.....	Z.....	3.....	6.1-6.3.....	1.5.....	II.
634	Binkosite.....	624...	$SO_3 \cdot ZnO$.....	.....	.....	.....	.....	4.390.....	.....	III.
634	A. Hydrocyanite.....	Ap. 2-29	$CuO \cdot SO_3$	19, 4, 8, 6.....	.....	.....	.....	.....	.....	III.
634	B. Dolerophanite.....	Ap. 2-17	$Cu_2 \cdot As_2O_3$	8.....	.....	.....	.....	.....	F.....	IV.
635	Leadhillite.....	624...	$PbO \cdot SO_3 + 3PbO \cdot Ce_2$	1, 5, 7.....	31 to 70.....	E.....	2.5.....	6.3.....	1.5.....	III.

Species No.	SPECIES.	Pages in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
635	A. Maxite.....	Ap. 2-38	$PbSO_3 \cdot PbCO_3 \cdot PbO \cdot H$ ($3 PbO \cdot SO_3 \cdot O_2 + 2 PbO$)	23	31	Tr.	2.5-3	6.87	E.	III.
636	Caledonite.....	625	$CO_2 + CuO \cdot CO_2$	21, 36, or 64	72	H.	2.5-3	3.4	E.	III.
637	Dreelite.....	626	$CaO \cdot SO_3 + 3 BaO \cdot SO_3$	31, 1	71	L.	3.5	3.3-3.4	E.	VI.
638	Susannite.....	626	$PbO \cdot SO_3 + 3 PbO \cdot CO_2$	1, 5, 7	70	D.	2.5	6.5	1.5	VI.
639	Connellite.....	627	$CuO \cdot SO_3 \cdot CuCl$	6	72					VI.
640	Glauberite.....	627	$NaO \cdot SO_3 + CaO \cdot SO_3$	5 to 7	72		2.5	2.7	1.5	IV.
641	Lunarkite.....	628	$PbO \cdot SO_3 + PbO \cdot CO_2$	4, 1, to 5, 7	71	D. W.	2.5	6.3-7	E.	IV.
642	Crocoite.....	628	$PbO \cdot CrO_3$	32, 3	72	E.	2.5-3	6	1.5	IV.
643	Phoenicocroite.....	630	$PbO \cdot Cr_2O_3$	32, 3	70	W.	3-3.5	5.7	E.	IV.
644	Vanquelinite.....	630	$CuO \cdot Cr_2O_3 + PbO \cdot Cr_2O_3$	2 to 34, 4	71, 70		2.5-3	5.6	E.	IV.
645	Jossaite.....	631	$CrO_3 \cdot PbO \cdot ZnO$	72, 50		E.	3.0	5.2	E.	III.
646	Pettikoite.....	631	FeO, FeO, SO_3	2	72		2.5		F.	IV.
647	Alumian.....	631	$AlO_3 \cdot 2SO_3$	1	72		2-3	2.74		VI.
650	Mascagnite.....	635	$NH_4O \cdot SO_4 \cdot H_2O$	1, 7, 5	72		2	1.7	V	III.
651	Boussingaultite.....	635	NH_4O, SO_3, MgO							Cry.
652	Leconteite.....	635	$RO \cdot SO_3 + 2H$	23	72		2-2.5		S	III.
652	A. Guanovulite.....	Ap. 2-64	($NH_4O \cdot SO_3 \cdot 2K_2O$) $SO_3 + 3(KO \cdot SO_3 \cdot H_2O)$ $(SO_3) - 4aq.$	5, 1	79		2	2.3-2.6	E.	
653	Mirabilite.....	636	$Na_2O \cdot SO_3 + 10H$	1	72		1.5-2	1.48	E.	IV.
654	Gypsum.....	637	$CaO \cdot SO_3 + 2H$	23, 1, 7	70, 72	radiating	2	2.3	2.5-3	IV.
655	Kieserite.....	641	$MgO \cdot SO_3 + H$	1	60		2.5	2.51	E.	III.
656	Polyhalite.....	641	($KO \cdot SO_3 + MgO \cdot SO_3$) $+ 2CaO \cdot SO_3 + 2H$	5 to 57, 3	72		2.5	2.77	1.5	III?
656	A. Syngenite.....	Ap. 2-54	$CaO \cdot SO_3 \cdot KO \cdot SO_3 + H$	64, 1					F.	IV.
657	Mamianite.....	642	$KO, MgO, CaO \cdot SO_3$	1	79	L. U.	2.5		1.5	IV.
658	Picromerite.....	642	(KO, MgO) $SO_3 + 3H$		79		2.5		E.	IV.
659	Bloedite.....	643	(MgO, NaO) $SO_3 + 2H$	1, 56, 3			2.5	2.24	E.	IV.
659	A. Simonyite.....	Ap. 1-14	(MgO, NaO) $SO_3 + 2H$	23 to 64, 4			2.5	2.24	E.	IV.
660	Loewite.....	643	(MgO, NaO) $SO_3 + Aq.$	5, 1, 3	72		2.5	2.37	1.5	III.
661	Epsomite.....	643	$MgO \cdot SO_3 + 7H$	23, 1	72		2.5	1.4	S	III.
662	aurisclite.....	644	$FeO \cdot SO_3 + H$	4	72		2	1.8		III.
662	A. Tectite.....	644	$SO_3 \cdot Fe_2O_3 + H$	63, 8						III.
663	Tausenite.....	645	$Zn^2O \cdot As_2O_3 + ZnO \cdot H$	58 to 45, 5	72	ct.	2-2.5	1.89	E.	III.
664	Melanterite.....	646	$FeO \cdot SO_3 + H$	4	72		2	1.6		IV.
665	Pisanite.....	646	(FeO, CuO) $SO_3 + 7H$	5	72	cry.			F.	IV.
668	Goslarite.....	647	$ZnO \cdot SO_3 + 7H$	1	72	E.	2-2.5	1.95	E.	III.
667	Bieberite.....	647	$CoO \cdot SO_3 + 7H$	45, 53, 3	72		1.92		F.	IV.
668	Morenosite.....	648	$NI_2O \cdot SO_3 + 7H$	43, 4 to 6, 4	72		2			IV.
669	Chalcantithite.....	648	$CuO \cdot SO_3 + 5H$	40, 6			2.5	2.21	E.	V.
669	A. Cnprimagnesite.....	Ap. 2-14	(CuO, MgO) $SO_3 + 7H$	6, 4						IV.
670	Cyanochroite.....	649	($3CuO + 3KO$) $SO_3 + 3H$	6						IV.
671	Alunogen.....	649	$AlO_3 \cdot 3SO_3 + 18H$	5, 3, 1	79		1.5-2	1.7		VI.
672	Coculimite.....	650	$FeO_3 \cdot 3SO_3 + 9H$	1 to 5			2.5	2		VI.
673	Tschermigite.....	651	($NH_4O \cdot SO_3 + AlO_3$) ($3SO_3 + 24H$)	23 to 1	72		1-2	1.50	S	IV.
674	Kalinite.....	652	$KO \cdot SO_3 + AlO_3 \cdot SO_3 + 24H$	1	72		2.25	1.75	E.	IV.
675	Voltaite.....	652	$FeOSO_3 + FeO_3 \cdot SO_3 + 24H$	2, 21, 4	72					IV.
676	Blakelite.....	652	$FeO_3 \cdot SO_3 + H$							IV.
677	Mendozite.....	653	$NaO \cdot SO_3 + AlO_3 \cdot SO_3 + 22H$	1			3	1.58	E.	IV.
678	Pickeringite.....	653	$MgOSO_3 + AlO_3 \cdot SO_3 + 22H$	1, 5	79		1		E.	IV.
679	Apjohnite.....	653	$MnOSO_3 + AlO_3 \cdot SO_3 + 24H$ ($MnO \cdot MgO$) $SO_3 + Al$	1	79				E.	IV.
680	Bosjemanite.....	654	($O_3 \cdot SO_3 + 22H$)						E.	IV.
681	Halotrichite.....	654	$FeOSO_3 + AlO_3 \cdot SO_3 + 22H$	5, 1	79	U.			E.	IV.
682	Roemerite.....	655	$RO \cdot SO_3 + FeO_3 \cdot SO_3 + 12H$	5, 8			2.75	2.17		IV.
683	Copiapite.....	655	$Fe_2O_3 \cdot SO_3 + 18H$	24, 5	31		1.5	2.14		VI.
684	Raimondite.....	656	$2FeO_3 \cdot 3SO_3 + 7H$	45, to 44, 5	31		3	3.19		VI.
684	A. Pastreite.....	656	$SO_3 \cdot SiO_2 \cdot AsO_3 \cdot FeO_3 \cdot PbO \cdot H$	5					A.	IV.
686	Fibroferrite.....	656	$3FeO_3 \cdot 5SO_3 + 27H$	1 to 19, 5			1.5	1.84	F	IV.
686	Apatelite.....	657	$3FeO_3 \cdot 5SO_3 + 2H$							IV.
687	Rotryogen.....	657	$FeO, FeO_3, SO_3 + H$	44, 5 to 3			2.5	2.04		IV.
687	A. Bartholomite.....	Ap. 2-6	$2NaO \cdot SO_3 + FeO_3 \cdot SO_3 + 2H$				1-2	1.66		IV.
688	Aluminite.....	658	$AlO_3 \cdot SO_3 + 9H$ ($AlO_3 \cdot 3SO_3 + 6CaO$)	1	66					VI.
688	A. Ettringite.....	Ap. 2-19	(H) - 26 aq.			W. E.	2	1.75		VI.
689	Alunite.....	658	$RO \cdot SO_3 + 3AlO_3 \cdot SO_3 + 5H$	1, 7	72	D.	2.5-4	2.6		VI.
690	Lewigite.....	659	$RO \cdot SO_3 + 3AlO_3 \cdot SO_3 + 9H$ ($KO \cdot NaO$) $SO_3 + 4$	19, 5		Z.	3-4	2.58		VI.
691	Jarosite.....	660	($FeO_3 \cdot SO_3 + 19H$)	44, 5			3	3.2	F.	VI.
692	Carphosiderite.....	661	$FeO_3 \cdot SO_3 + H$	46, 5	70		4	2.5		VI.
693	Paraluminite.....	661	$Al_2O_3 \cdot SO_3 + 15H$	1 to 19, 5						VI.
694	Pisophanite.....	661	$AlO_3 \cdot SO_3 + FeO_3 \cdot SO_3 + H$	19 to 34, 4	72		1.5	1.96		VI.
695	Felsobanyite.....	662	$Al_2O_3 \cdot SO_3 + 10H$	1, 5	31	W.	1.5	2.33		III.
696	Gloekerite.....	662	$FeO_3 \cdot SO_3 + 6H$ ($SO_3 \cdot PbO \cdot MnO \cdot MgO$)	8, 5, 4, 2	70	G.				VI.
697	Lamprophanite.....	663	($CaO \cdot NaO \cdot KO \cdot H$)	1	31, 1	L.	3	3.07		VI.
700	Linarite.....	663	$PbO \cdot SO_3 + CuO \cdot H$	33, 6	72	E.	2.5	5.4	E.	IV.
701	Brochantite.....	664	$CuO \cdot SO_3 + 2CuO \cdot H$	37 to 2, 4		E.	3.5-4	3.4-3.9	E.	III.
702	Langite.....	665	$CuO \cdot SO_3 + 3CuO \cdot H + H$	4, 6			2.5-3	3.5	F.	III.
703	Cyanotrichite.....	666	SO_3, AlO_3, CuO, H	6	31					III.

Species No.	SPECIES.	Page in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.*	Crystallization.
704	Woodwardite.....	666.	$\text{CuSO}_4 \cdot \text{CuOH} \cdot \text{AlO}_3 \cdot 6\text{H}_2\text{O}$	6-4, 6.						
705	Johannite.....	666.	$\{ (\text{U}_3\text{O}_8 \text{ U O}_3) \text{ S O}_3 + \frac{1}{2} \text{H}_2\text{O} \}$ $\{ (\frac{1}{2} \text{U}_3\text{O}_8 \text{ U O}_3 + \frac{1}{2} \text{Ca}_2\text{O}) \}$ $\{ \text{S O}_3 + \text{CuO} \cdot \text{SO}_3 + 9\text{H}_2\text{O} \}$	37, 4.	72	72	2-2.5	3.19	F.	IV
706	Uranochalcite.....	667.	$\text{UO}_3 \text{ S O}_3 + \text{Ca}_2\text{O} \text{ S O}_3 + 15\text{H}_2\text{O}$	38, 4.	79	J.	2-2 1/2			M.
707	Medjinite.....	667.	$\text{UO}_3 \text{ S O}_3 \cdot \text{H}_2\text{O}$	5.	79		2.5			
708	Zippelite.....	667.	$\text{UO}_3 \text{ S O}_3 \cdot \text{H}_2\text{O}$	5.	79		3			
709	Voglianite.....	668.	$(\text{U}_3\text{O}_8 \text{ U O}_3) \text{ S O}_3 + 2\text{H}_2\text{O}$	39 to 86, 4.	19, 4.					A.
710	Uraconite.....	668.	$\text{U}_3\text{O}_8 \text{ S O}_3 + 14\text{H}_2\text{O}$	26 5.						
711	Montanite.....	668.	$\text{Bi O}_3 \text{ Te O}_3 + 2\text{H}_2\text{O}$	5, 1.						
712	Kerstenite.....	669.	$\text{Se O}_3 \cdot \text{Pb O}_2$	24, 5.	72, 78.	ct. F.	soft			E. M.
715	Calcite.....	670.	Ca O C O_2	23, 1, and —	72	I.	3	2.6-2.8		VI
716	Dolomite.....	681.	$\text{Mg O C O}_2 + \text{Ca O C O}_2$ $\{ \text{Ca O C O}_2 + (\text{MgO}, \text{FeO}) \}$ $\{ \text{Mn O C O}_2 \}$	1, 7, 8, etc.	72 to 31	I.	3.5-4.	2.8-2.9		
717	Ankerite.....	685.	Mg O C O_2	1, 7, 3.	72	I.	3.5-4.	2.95-3.1		VI
718	Magnesianite.....	685.	Mg O C O_2	1, 5, 7, 8, 4.	72	I.	3.5-4.5	3-3.1		VI
719	Mesitite.....	687.	$2 \text{Mg O C O}_2 + \text{Fe O C O}_2$	5, 1, 7, 8.	72 to 31	I.	4-4.5	3.35		VI
720	Pistomesite.....	688.	$\text{Mg O C O}_2 + \text{Fe O C O}_2$ $\{ \text{Fe O C O}_2 \text{ (with Mn O)} \}$ $\{ \text{Ca O Mg O} \}$	5, 1 to 5, 7.	31	I. C.	3.5-4.	3.41		VI
721	Siderite.....	688.	Fe O C O_2	47, 7 to 8, 3	72 to 31	I.	4	3.6-3.9	4.5	VI
722	Rhodochrosite.....	691.	Mn O C O_2	53, 3, 7, 8.	72 to 31	I.	3.5-4.5	3.5		VI
723	Smithsonite.....	692.	Zn O C O_2	1, 7, 4, 6, 5, 3	72		4	4.4		VI
724	Aragonite.....	694.	Ca O C O_2	23, 1, 5, 3, 6	72		3.5-4.	2.9-3		III
725	Manganocalcite.....	697.	$2 \text{Mn O C O}_2 + (\text{CaO MgO}) \text{CO}_2$	66, 3.	72		4-5	3.037		Col.
726	Witherite.....	697.	Ba O C O_2	1, 7	72		3.5	4-3		III
727	Bromlite.....	698.	$\text{Ba O C O}_2 + \text{Ca O C O}_2$	1, 23, 7, 19, 9	72	C. H.	4-4.5	3.718		III
728	Strontianite.....	699.	Sr O C O_2	1, 7, 5, 4.	72	E.	3.5-4.	3.7		III
729	Cerussite.....	700.	Pb O C O_2	1.	72 to 71	Z.	3.5	6.4		III
730	Barytocalcite.....	701.	$\text{Ba O C O}_2 + \text{Ca O C O}_2$ $\{ (\text{CeO}, \text{LaO}, \text{DiO}) \text{CO}_2 + \}$ $\{ \frac{1}{2} (\text{Ca}, \text{Ce}) \text{Fl} \}$	1, 7, 5, 4.	72	E.	4	3.6		IV
731	Parisite.....	702.	$\frac{1}{2} (\text{Ca}, \text{Ce}) \text{Fl}$	8, 5.	70	D.	4.5	4.35		VI
732	Kischitimitite.....	703.	$3 \text{La O C O}_2 + \text{Ce}_2 (\text{FIO})^3 + \text{H}_2\text{O}$	21, 8, 5.	72, 78.			2.784		A.
732 A	Bastnázsite.....	Ap. 1-2	$\text{Ce Fl} + 2 (\text{CeO}, \text{LaO}) \text{CO}_2$	59 5.	78	ct.	4	4.93		III?
733	Phosgenite.....	703.	$\text{Pb O C O}_2 + \text{Pb Cl}_2$	1.	71	3 cleav.	3	6.2		E. II
735	Tschermacherite.....	705.	$(\frac{1}{2} \text{N H}_4 \text{O} + \frac{1}{2} \text{H O}) \text{CO}_2$	5, 1.			1.5	1.45		V
736	Natron.....	705.	$\text{Na O C O}_2 + 10\text{H}_2\text{O}$	7, 1.	77		1.5	1.4		E. IV
737	Thermonatrite.....	705.	$\text{Na O C O}_2 + \text{H}_2\text{O}$	7, 1.			1.5	1.5-1.6		E. III
738	Trona.....	706.	$2 \text{Na O C O}_2 + 4\text{H}_2\text{O}$	7, 1.			2.5-3	2.11		E. IV
739	Gay-lussite.....	706.	$\text{NaO C O}_2 + \text{CaO C O}_2 + 5\text{H}_2\text{O}$	1.	72, 31		2-3	1.99		E. IV
740	Hydromagnesite.....	707.	$3 (\text{Mg O C O}_2 + \text{H}) + \text{MgO H}$	1.	79, 66.		3.5	2.1		IV
741	Hydrodolomite.....	708.	$(\text{CaO MgO}) \text{CO}_2 + \frac{1}{2} \text{H}_2\text{O}$	5, 7, 4, 1	72			2.5		M.
742	Predazzite.....	708.	$2 \text{Ca O C O}_2 + \text{Mg O H}$	1 to 7, 1.	72		3.5	2.63		M.
743	Pencatite.....	708.	$\text{Ca O C O}_2 + \text{Mg O H}$	6, 7.	72		3	2.5		M.
744	Hovite.....	709.	$(\frac{1}{2} \text{CaO} + \frac{1}{2} \text{H}) \text{CO}_2 + \text{aq}$	1.		G.	soft			
745	Lanthanite.....	709.	$\text{La O C O}_2 + 3\text{H}_2\text{O}$	7, 1, 9, 5.	31 or 66	Mi.	2.5-3	2.666		III
746	Tengerite.....	710.	$\text{Yt O}, \text{C O}_2$	1.	66					
747	Zaratite.....	710.	$\text{NiO C O}_2 + 2 \text{Ni O H} + 4\text{H}_2\text{O}$	37, 4.	72		3-3.25	2.6		S.
748	Remingtonite.....	711.	$\text{Co O C O}_2 \text{ H}$	1.	19, 53.		soft			
749	Hydrozincite.....	711.	$\text{Zn O C O}_2 + 2 \text{Zn O H}$	1, 7, 5.	66		2-2.5	3.7		M.
750	Aurichalcite.....	712.	$\text{Cu O}, \text{Zn O}, \text{C O}_2, \text{H}$	6, 4.	31		2			D.
750 A	Zinkazurite.....	713.	$\text{S O}_3, \text{Zn O}, \text{Cu O}, \text{C O}_2, \text{H}$	6.				3.49		Cry
751	Malachite.....	713.	$\text{Cu O C O}_2 + \text{Cu O H}$	38 to 37, 4.	79 to 77	U.	3.5-4.	3.8		IV
751 A	Mysorin.....	715.	$\text{C O}_2, \text{Cu O}, \text{Fe O}_3$	2, 8.		Z.	soft	2.62		M.
751 B	Limé Malachite.....	715.	$\text{C O}_2, \text{Cu O}, \text{S O}_3, \text{CaO FeO}_3$	36, 4.	79	L. U.	2.5			M.
752	Azurite.....	715.	$2 \text{Cu O C O}_2 + \text{Cu O H}$	6.	72			3.7		IV
753	Bismutite.....	716.	$\text{Bi O}_3, \text{C O}_2, \text{H}$	1 to 5.	66		4-4.5	6.8-7.6		E. A.
754	Liebigite.....	717.	$\text{U O}_3 \text{ C O}_2 + 2 \text{CaO C O}_2$ $\{ + 3 \text{Cu O } 2 \text{CO}_2 + 14 \text{H} \}$	43, 4.		cry.	2-2.5			
755	Voglite.....	717.	$\text{U O}_3 \text{ C O}_2 + 2 \text{CaO C O}_2$	37, 4.	31					
755 A	Schröckerite.....	Ap. 2-50	$\text{C O}_2 \text{ U O H}$	4, 5.						
756	Whewellite.....	718.	Oxalate of Ca O			Z.	2.5-2.7			IV
757	Thierschite.....	718.	Oxalate of Ca O							
758	Humboldtine.....	718.	Oxalate of Fe O	5.	66, 70.	G. H.	2	2.13-2.48		E. C.

(VI.) Hydrocarbon Compounds.

761	Tetrylic Hydrid.....	720.								
762	Pentrylic Hydrid.....	720.								
763	Hexylic Hydrid.....	720.								
764	Heptylic Hydrid.....	720.								
765	Octylic Hydrid.....	720.								
766	Nonylic Hydrid.....	720.								
767										
768										
769	Beta-Naphtha Group.....	720.								
770										
771										
772	Scheererite.....	727.	C H_4	1, 7, 5, 4, 3.	31		soft	1-1.2		E. IV
773	Charnatite.....	728.	$\text{C}_2 \text{H}_6$	4 to 59, 5.	78 to 79					E.

Species No.	SPECIES.	Page in Dana.	COMPOSITION.	Color.	Streak or Lustre.	Cleavage or Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
774	Decatylene.....	729...								
775	Eudecatylene.....	729...								
776	Dodecatylene.....	729...								
777	Decatryylene.....	729...	Petroleum Oils.....							
778	Urpethite.....	731...	C H.....	8, 5.....			soft.....	0.885.....	E.....	
779	Hatchettite.....	731...	C H.....	5, 1.....	74, 31.....		soft.....	0.916.....	E.....	M.
780	Ozocerite.....	732...	C H.....	23 to 1.....			soft.....	0.85-0.90.....	F.....	
781	Zietrisikite.....	733...	C H.....	8.....			soft.....	0.9.....	E.....	
781 A	.....	733-4...	C H.....	21, 8.....			soft.....	0.959.....	E.....	
781 B	B. Nef-Gil.....	734...	C H.....	8.....				0.956.....	E.....	
781 C	C. Pyropissite.....	734...	C H.....	7, 8.....				0.49-0.52.....	E.....	
782	Elaterite.....	734...	C H.....				soft.....	0.905-1.23.....	E.....	M.A.
783	Settling Stones Resin.....	735...	C H.....	5.....				1.16-1.54.....	E.....	IV.
784	Fichtelite.....	735...	C ₅ H ₈	1.....	78.....		1.....		E.....	IV.
785	Haritite.....	736...	C ₅ H ₁₆	1.....	78.....		1.....		E.....	IV.
786	Dinitite.....	736...	C H.....	1 to 5.....					E.....	
787	Ixolyte.....	736...	C H.....	32, 3.....	78.....	J.....	1.....	1.008.....	E.....	A.
788	Benzole.....	737...								
789	Toluole.....	737...								
790	Xylole.....	737...	Benzole Group.....							
791	Cumole.....	737...								
792	Cymole.....	737...								
793	Könilit.....	737...	C. H.....	3, 8, 5.....			soft.....	0.88.....	E.....	A. S.
794	Naphthalin.....	738...	C ₁₀ H ₈	1.....	75, 74.....			1.153.....	F.....	III.
795	Idrialite.....	738...	C ₃ H ₂	1.....					F.....	
795 A	A. Aragotite.....	Ap. 2-4...	C. H.....	5.....					V.....	
796	Geocerite.....	738...	C ₂₈ H ₅₀ O ₂	1.....			soft.....		E.....	
797	Geomyricite.....	739...	C ₃₄ H ₆₈ O ₂	1.....		C.....	soft.....		E.....	
798	Copalite.....	739...	C _{85.5} H ₁₁₅ O ₃ %.....	5, 7, 21, 8.....				1.010.....	E.....	
799	Succinite.....	740...	C ₇₈ H ₁₁₀ O ₁₁	5.....	71.....		2-2.5.....	1.065-1.081.....	E.....	M.
799 A	A. Krantzite.....	741...	C ₄₀ H ₆₄ O ₄	5.....				1.002.....	F.....	
799 B	B. Ambrosine.....	Ap. 1-1...	C. H. O.....	5 to 63, 8.....	70.....	Z.....			F.....	M.
800	Wolchowite.....	741...	C _{80.5} H ₁₀₅ O ₉ %.....	5.....	70.....		1.5-2.....	1.9.....	E.....	M.
801	Bucaramangite.....	741...	C _{82.5} H ₁₁₁ O _{6.5} %.....	19, 5.....				1.....	E.....	
802	Ambrite.....	741...	C ₇₇ H ₁₀₅ , O _{12.5} %.....	7, 5.....	78.....	Z.....		2.....	1.034.....	A.
803	Bathvillite.....	742...	C ₃₀ H ₅₀ O ₃	66, 8.....				1.01.....		A.
804	Torbanite.....	742...	C ₄₀ H ₆₈ O ₂				2, 25.....	1.18.....		
805	Xyloretinite.....	742...	C ₂₀ H ₁₇ O ₄	1.....				1.115.....		M.
805 A	A. Bombicite.....	Ap. 2-8...	H ₁₃ O C.....	23.....			0.5-1.....	1.06.....	F.....	II.
806	Leucopetrite.....	743...	C ₅₀ H ₈₄ O ₃						F.....	
807	Euosmitite.....	743...	C ₈₂ H ₁₂ O ₆ %.....	5, 8.....		F.....	1.5.....	1.2-1.5.....		M.A.
807 A	A. Rosthornite.....	Ap. 1-14...	C ₂₄ H ₄₀ O.....	8.....	78.....			1.076.....		M.
808	Scleretinitite.....	744...	C ₇₇ , H ₉ , O _{10.3} %.....	2.....		Z.....	3.....	1.136.....	E.....	
809	Pyroretinitite.....	744...	C ₄₀ , H ₅₆ , O ₄						E.....	
810	Reussinitite.....	744...	C ₄₀ , H ₅₆ , O _{3.5} %.....	8, 3.....					E.....	
811	Rochlederite.....	744...	C H O.....	3, 8.....					E.....	
812	Schlanite.....	745...	C _{81.5} , H ₉ , O _{9.5} %.....	8.....					E.....	
813	Guyaquilite.....	745...	C ₄₀ H ₅₂ O ₆	19, 5.....				1.092.....	E.....	A.
814	Middletonite.....	745...	C ₄₀ H ₄₄ O ₂	3, 8.....		F.....		1.6.....	E.....	M.
815	Stankite.....	745...	C ₃₉ H ₄₄ O ₆							
816	Anthracoxenite.....	746...	C ₄₀ H ₃₃ O ₇	2.....					E.....	
817	Tasmanite.....	746...	C ₄₀ , H ₆₂ , O ₂ %.....	3, 8.....		Z.....	2.....	1.18.....	F.....	
818	Dysodile.....	746...		5, 4, 7.....				1.14-1.25.....		
819	Hircite.....	747...		8.....		Z.....			F.....	A.
820	Baikerinitite.....	747...							F.....	
820 A	A. Doppelrite.....	747...		7.....			soft.....		F.....	
821	Butyrellite.....	747...	C ₃₂ H ₄₄ O ₄	1.....			soft.....		E.....	
822	Geocrellite.....	748...	C ₂₈ H ₅₀ O ₄	1.....		F.....			E.....	
823	Brücknerellite.....	748...	C ₂₄ H ₄₄ O ₈						E.....	
824	Succinellite.....	748...	C ₄ H ₃ O ₄	23, 1.....			1.....	1.55.....		III.
825	Retinellite.....	748...	C ₂₁ H ₂₃ O ₃	8.....						
826	Dopplerite.....	749...	C ₁₀ H ₁₂ O ₅	8, 2.....			0.5.....	1.089.....		A.
827	Melanellite.....	750...	C ₆₅ , H ₄₆ O ₂₀ %.....	2.....						
828	Mellitite.....	750...	AlO ₃ , 3 Mellitic acid + 18 H.....	45, 5.....		Z, X.....	2-2.5.....	1.55-1.65.....		II.
829	Pigotite.....	750...	4 AlO ₃ - C ₆ H ₁₀ O ₄ + 27 H.....							
829 A	A. Organic Salt of Iron.....	750...	Fe O ₃ &c.....							
830	Asphaltum.....	751...	C ₁₀ H ₄₄ O ₆	8, 2 & 2.....				1-1.8.....	E.....	A.
830 A	A. Grahamite.....	753...	C. H. O.....	2.....			2.....	1.145.....	F.....	
830 B	B. Albertite.....	753...	C ₈₆ H ₉ O ₂ N ₃ %.....	1-2.....			1-2.....	1.097.....	E.....	
830 C	C. Planzite.....	753...		8, 4, 2.....			1.5.....	1.220.....	E.....	
830 D	D. Berengellite.....	753...	C ₄₀ H ₆₂ O ₈	8, 2.....					E.....	
831	Mineral Coal.....	753...	C &c.....	2.....		Z, H.....	0.5-2.5.....	1-1.80.....		C.M.
832	Azomite.....	761...	Cb O ₅ Ca O O ?.....	1.....			4-4.5.....			II.
833	Brewsterlinite.....	761...		23.....						
834	Cryptolinite.....	762...		23.....						
835	Hessenbergete.....	762...	Si O ₂ &c.....	6.....			7-7.5.....			IV.
836	Parathorite.....	763...		3 to 2.....			5-5.5.....		6.....	III.
837	Pyrrhite.....	763...	Cb O ₅ Zr O ?.....	56, 5.....			6.....			L.
838	Alurgite.....	764...	Mn &c.....							

REFERENCES.—Pages alone refer to Dana's Mineralogy. Ap. means appendixes to Dana, and the first number following indicates the Appendix—1, 2, or 3. The second number indicates the page. Sm. indicates Dana's report on Mineralogy in the Smithsonian Annals for 1883, '84, '85. A.J. indicates the Am. Jour. of Sciences and Arts, and is followed by the number of the Volume and Page. For other abbreviations see "Table of Mineral Species."

NEW SPECIES NAMES.	References.	Composition in percentage or Formulae.	Color.	Streak and Lustre.	Cleavage and Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
Abriachanite.....	Ap. 3-1.....	Fe ₂ O ₃ 15, FeO 10, MgO 11, Na ₂ O 7, H ₂ O 5.....	75, 6	77	U	.....	3.326	inf.	A.
Achrematite.....	Ap. 3-1.....	3(3 Pb ₂ As ₂ O ₈ + PbCl ₂ + 4 (Pb ₂ MoO ₈).....	19, 24.5, -56, 3	19, 8, 70-71	H to sub Z	3-4	5.96-6.17	E.	M.
Aerinite.....	Ap. 3-2.....	SiO ₂ 49, Al ₂ O ₃ 8, Fe ₂ O ₃ - FeO 33, CaO 4 H ₂ O 6 etc.	75, 6	77	.....	3-4	3.018 4.31	.....	M.
Agnesite.....	793.....	Bi etc.....	.....	.....	.....	.....	.....	.....	.....
Aikite.....	Ap. 3-3.....	A resin near Amber.	.....	.....	.....	.....	.....	.....	.....
Alaskaite.....	Ap. 3-3.....	(Ag ₂ Cu ₂ Pb)S + Bi ₂ S ₃	1, 11-7	73	.....	.....	6.878	.....	M.
Allakite.....	Sm. '84.....	Mn ₂ As ₂ O ₈ + 4 H ₂ MnO ₂	3, 5, 6, 4	72	Spli	4-5	3.83-3.85	.....	IV
Amblystegite.....	Ap. 1-1.....	SiO ₂ 50, Al ₂ O ₃ 6 FeO 26, MgO 18.....	8-3, 8	4, 7, 71, 72	Z	7	3.454	5	III
Andrewsite.....	Ap. 1-1.....	3 (Fe ₂ O ₃ PO ₄ + 3 Fe ₂ O ₃ + 3 H ₂ O) + 3 CuO, PO ₄	6, 4	.....	.....	.....	3.475	.....	F. R.
Antillite.....	Ap. 1-1.....	SiO ₂ 39, MgO 36, FeO 6.7, H ₂ O 16.72.....	21, 4, 8	80	U	3.5-4	2.52	.....	.....
Annerödite.....	Ap. 3-7.....	R ₂ Cp ₂ O ₇ + 2½ aq.....	2	73-Sub 73	Sub Z	6	5.7	6	III
Anomite.....	Ap. 3-77.....	Si ₂ Al ₆ K ₄ H ₂ O ₂₄ + Si ₆ Mg ₁₂ O ₁₂.....	.....	.....	.....	A	biotite	mi	ca.
Arequipite.....	Ap. 3-9.....	PbO 80 SiO ₂ 12.....	45, 5	.....	Z	6	.....	D	.....
Argentobismutite.....	A.J. 31, 229.....	Ag ₂ S + Bi ₂ S ₃.....	.....	.....	.....	.....	.....	.....	.....
Argyrodite.....	A.J. 32, 163.....	Si ₇ Germanium 7, Ag 75, As ₂ O ₃ 45, MnO 28, Fe ₂ O ₃ 4, PbO ₂ CuO 8.....	12, 7, 3	7, 2, 74, 73	F	2.5	6.09-6.11	.....	IV
Arsenopleite.....	A.J. 35, 416.....	.....	.....	.....	.....	.....	.....	.....	.....
Atopite.....	Ap. 3-10.....	R ₂ Sb ₂ O ₇	5-70, 8	78	nod.	5-5.6	5.03	F	I
Auerlite.....	A.J. 36, 461.....	ThO ₂ (SiO ₂ ½P ₂ O ₅)2H ₂ O.....	5, 1-56, 3	.....	.....	2.5-3	4.4-4.7	.....	II
Barrenite.....	Ap. 3-11.....	H ₂ O 4.....	2, 7	66, 77-47, 7	=	5.5	5.343	6	M.
Barylite.....	Ap. 3-12.....	Ba ₂ (Al ₂) ₂ Si ₂ O ₂₄	23	78	.....	7	4.03	.....	E.
Barysil.....	A.J. 35, 417.....	3 PbO, 2 SiO ₂	1	.....	.....	3	6.11-6.55	.....	VI
Beegerite.....	Ap. 3-13.....	.....	7	73	A	.....	7.273	.....	I
Belonite.....	A.J. 35, 417.....	MgO, MoO ₃.....	.....	.....	aeic.	.....	.....	.....	II
Bementite.....	A.J. 35, 417.....	2 (H ₂ Mn)O.SiO ₂	7, 5	.....	fria. L.	.....	2.981	.....	St.
Bertrandite.....	Sm. '83.....	2 Be ₂ SiO ₄ + H ₂ O.....	23-5	72, 75	.....	6	2.59	.....	III
Beryllonite.....	A.J. 37, 23.....	Na BePO ₄	1	72-75	W Z	5.5-6	2.84	.....	III
Blomstrandite.....	Ap. 3-16.....	Cu ₂ O ₂ Ta ₂ O ₅ 50, TiO 11, UO ₂ 4, H ₂ O 8.....	2	72	.....	5.5	4.17-4.25	D.	M.
Brackebuschite.....	Ap. 3-36.....	R ₂ V ₂ O ₈ + H ₂ O.....	2	.....	.....	.....	.....	.....	E.
Bravaisite.....	Ap. 3-18.....	R ₂ (Al ₂) ₂ Si ₂ O ₂₆ + 8 aq.....	4-7, 4	66	L	1-2	2.6	1	III
Bröggerite.....	Sm. '84.....	U ₂ O ₅ 80, PbO 8.5, ThO 5.5.....	13, 2	.....	.....	5-6	8.73	.....	I
Buckingtonite.....	A.J. 36, 156.....	2Fe ₂ (SO ₄) ₃ + 2H ₂ SO ₄ + 7 FeSO ₄ + 60 aq.....	21, 8	.....	Tr.	.....	.....	.....	V
Cacoclasite.....	This Cat.....	SiO ₂ 37, Al ₂ O ₃ 20, CaO 38 +.....	1	1, 70-72	G	5-6	3.05	3	II ?
Calcozincite.....	Ap. 3-20.....	ZnO 81, CaO 8, CO ₂ 6, H ₂ O 4.....	69, 56, 5	.....	Colum.	3.5	3.95	.....	G
Cappelenite.....	Sm. '85.....	SiO ₂ 14, B ₂ O ₃ 17, Y ₂ O ₃ 53, La ₂ (Di ₂)O ₃ , BaO 8.....	8	78	.....	.....	4.407	.....	VI
Caryinite.....	Ap. 3-20.....	R ₂ As ₂ O ₈ (R = PbO, MnO).....	8-5, 8	5, 1, 78	Splint.	3-3.5	4.25	.....	M.
Catlinite.....	793.....	SiO ₂ 55, Al ₂ O ₃ 18, Fe ₂ O ₃ 6, Na ₂ O K ₂ O 12 +.....	3	3	G	soft	.....	.....	A.
Chalcomenite.....	Ap. 3-23.....	Cu Se O ₃ + 2 aq.....	75, 6	trans	.....	.....	.....	F.	IV
Chalcophanite.....	Ap. 3-23.....	(MnZn)O + 2MnO ₂ + 2 aq.....	6, 2-13, 2	8, 73, 75	M. I.	2.5	3.907	6	VI
Chloralluminite.....	Ap. 3-25.....	(Al ₂ Cl ₆ + xH ₂ O).....	.....	.....	.....	.....	.....	.....	.....
Chloromagnesite.....	Ap. 3-25.....	(MgCl ₂ + x aq).....	23-1	72-66	L to U	1-2	1.65	.....	.....
Chlorothionite.....	Ap. 3-25.....	K ₂ SO ₄ + CuCl ₂	75, 6	.....	.....	.....	.....	.....	.....
Chlorotile.....	Ap. 3-26.....	Cu ₂ As ₂ O ₈ + 6 aq.....	19, 4-37, 4	.....	.....	.....	.....	.....	III M
Cleveite.....	Ap. 3-27.....	U ₂ O ₅ 42, Y ₂ O ₃ 7, ThO ₂ 5, PbO 11, UO ₂ 24, etc.....	13, 2	2, 8, 66	.....	5.5	7.49	inf.	I
Cliftonite.....	A.J. 34, 232.....	.....	2	.....	.....	2.5	2.12	.....	I
Clinocrocoite.....	Ap. 3-28.....	Al ₂ O ₃ 4, Fe ₂ O ₃ 9, Na ₂ O, K ₂ O, SO ₃ , H ₂ O.....	Saff, 5	.....	.....	.....	.....	.....	IV
Clinophaeite.....	Ap. 3-28.....	SO ₃ 37, Fe ₂ O ₃ 9, FeO 6, K ₂ O 22, H ₂ O 15.....	2, 4	7, 4, 72	.....	?	2.979	.....	IV
Cobaltomenite.....	Sm. '82.....	Co Selenite.....	53, 3	.....	.....	.....	.....	.....	Cry.
Colemanite.....	Sm. '84.....	2 CaO, 3 B ₂ O ₃ + 5 H ₂ O.....	1-23	1, 81	Cld. W	4	2.43	.....	IV
Coloradoite.....	Ap. 3-29.....	Hg Te.....	13, 2	73	H to sub Z	3	8.627	1	M.
Coronguite.....	Ap. 3-30.....	Sb ₂ O ₃ 59, PbO 21, Ag ₂ O 8, H ₂ O 11.....	7, 5	70	G	2.5-3	5.5	.....	A.
Cossyrite.....	Ap. 3-31.....	SiO ₂ 44, Fe ₂ O ₃ 8, Al ₂ O ₃ 5, FeO 33, Na ₂ O 5.....	2	.....	E & Ct	.....	3.74	1	V
Cryptiolite.....	A.J. 35, 417.....	P ₂ O ₅ 49, MgO 34, CaO 15.....	45, 5	.....	Tr.	.....	2.674	.....	IV
Crystobalite.....	A.J. 34, 73.....	SiO ₂	1	.....	.....	7	.....	inf.	I
Cuprocalcite.....	Ap. 3-32.....	(Cu ₂ O ₂ CO ₂ + 2 CaCO ₃ + H ₂ O).....	.....	.....	.....	3	3.9	.....	M.
Cuspidine.....	Ap. 3-33.....	Ca ₂ Si ₂ O ₇ + CaF ₂	19, 53, 3	.....	D	5-6	2.853	.....	III
Cypsinite.....	Ap. 3-33.....	Fe ₂ O ₃ 51, SO ₃ 21, H ₂ O.....	5	.....	.....	2	1.7	.....	.....
Dahlite.....	A.J. 37, 77.....	4 Ca ₃ F ₂ O ₈ + 2 CaCO ₃ + H ₂ O.....	19, 5, 1-3, 5	66	U	5	3.053	.....	.....

NEW SPECIES NAMES.	References.	Composition in percentage or Formulae.	Color.	Streak and Lustre.	Cleavage and Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
Daubrécite.....	Ap. 3-34.	FeS + Cr ₂ S ₃	2	2-73, 75	H	.....	5.01	inf.	M.
Daubreite.....	Ap. 3-35.	4 (Bi ₂ O ₃) + Bi ₂ Cl ₃	5-7, 1	.....	G	2-2.5	6.4	4	A.
Daureuxite.....	Ap. 3-35.	H ₂ (Mn Mg) (Al ₂) ₂ Si ₆ O ₁₄	1-48, 3	.....	trans	.....	.....	inf.	III
Dawsonite.....	Ap. 2-16.	Al ₂ O ₃ .33Na ₂ O.20CO ₂ .30H ₂ O.12P ₂ O ₅	1	72	U	3	2.40	.....	IV
Estévezite.....	Ap. 3-36.	CaO + 5As ₂ O ₅ .5V ₂ O ₅ .Fe ₂ O ₃ .Al ₂ O ₃	5, 1	65	G	.....	.....	.....	M.
Diabantite.....	Ap. 3-37.	SiO ₂ .34Al ₂ O ₃ .11FeO.25MgO.17H ₂ O.....	21, 4	.....	.....	1	2.79	.....	M.
Diadelphite.....	Sm. '84.	Mn Arsenate + 2aq.....	3 or 8, 3	69, 8	.....	3.5	.....	.....	VI
Dickinsonite.....	Ap. 3-37.	4R ₂ P ₂ O ₈ + 3aq.....	34-38, 4	1, 72, 31	H	3.5-4	3.34	2	IV
Dietrichite.....	Ap. 3-38.	(Zn Fe Mn)SO ₄ + Al ₂ S ₃ O ₁₂ + 22aq.....	22, 1-8, 5	79	.....	2	.....	F.	IV
Dihydrothenardite.....	A.J.35, 418	Na ₂ SO ₄ + 2aq.....	69, 6-21, 6	79	U	.....	.....	inf.	IV
Duporthite.....	Ap. 3-39.	SiO ₂ .49Al ₂ O ₃ .27FeO.6MgO.11H ₂ O.....	4-8, 7	79	.....	2	2.78	.....	F.
Durfeldtite.....	Ap. 3-40.	3 Pb Ag S + Sb ₂ S ₃	69, 7	73	.....	2.5	5.40	.....	M.
Duxite.....	Ap. 3-40.	C7H ₈ , H ₂ S, O13, S ₂ .42.....	21, 8	.....	.....	.....	1.133	1	.....
Dysanylite.....	Ap. 3-40.	RCl ₂ O ₆ + 6 R Ti O3, R = Fe, Ca, etc.....	2	15-5	A	.....	4.13	.....	I
Edisonite.....	A.J.36, 272	TiO ₂	5, 1, 70, 71	Small Z	.....	6	4.216	Inf.	III
Eggonite.....	Ap. 3-40.	Cd Si O ₃	69, 7, 8	Sub. 71	D	4-5	.....	.....	V
Ekdomite.....	Ap. 3-41.	Pb ₂ As ₂ O ₃ + 2 Pb Cl ₂	75, 5-4	72-78	F	2.5-3	7.14	E.	II ?
Elpasolite.....	Sm. '85.	F47, Al11, K 29, Na10.....	23	.....	S	.....	.....	.....	.....
Elrouquite.....	Ap. 3-41.	Al ₂ O ₃ .16Fe ₂ O ₃ .14SiO ₂ .16P ₂ O ₅	32 H ₂ O.22.....	43, 4-7	66	Z	6	2.35	Am.
Emmonsite.....	A.J.31, 476	Te 58.7, Se 0.53, Fe 14.29, H ₂ O ?.....	5, 4	75	T	6	5	.....	IV ?
Empholite.....	Sm. '85.	Al ₂ O ₃ .3SiO ₂ + aq.....	1	.....	W	.....	.....	inf.	III
Endlichite.....	Sm. '85.	Pb ₂ Cl (AsO ₄) ₃ + Pb ₂ Cl (VO ₄) ₃	5, 1-56, 3	.....	.....	.....	6.864	.....	VI
Enysite.....	Ap. 3-42.	SO ₂ .8, Al ₂ O ₃ .30 Cu O 17, SiO ₂ .3, H ₂ O 14, +.....	6, 4	.....	.....	2-2.5	1.59	.....	S
Erythrozincoite.....	Ap. 3-43.	Mn Zn S.....	2	19, 5	.....	.....	.....	F	.....
Eucrasite.....	Ap. 3-43.	SiO ₂ .16, Th O ₂ .36 +.....	2, 8	8, 78	H	4.5-5	4.39	4	III
Eucryptite.....	Ap. 3-44.	Li ₂ (Al ₂) Si ₂ O ₆	1	.....	D	.....	2.667	.....	VI
Fairfieldite.....	Ap. 3-45.	Ca ₂ (Mn ₂ Fe ₂) P ₂ O ₈ + 2aq.....	1-19, 46, 5	1, 31, 8, 71	W	3.5	3.15	4.15	V
Fiedlerite.....	A.J.35-418	Near Laurionite.....	.....	.....	Tr	.....	.....	.....	IV
Fillowite.....	Ap. 3-47.	3 (Mn Fe Ca Na ₂) P ₂ O ₈ + aq.....	59, 5-3, 8	1, 70-78	H	4.5	3.43	1.5	IV
Franklandite.....	Ap. 3-48.	Na ₂ Ca ₂ B ₂ O ₇ .15 H ₂ O.....	1	.....	U	1	1.65	E	MF
Freyalite.....	Ap. 3-48.	SiO ₂ .21, Ce ₂ O ₃ .29, ThO ₂ .28, etc.....	8	5, 7, 70	.....	.....	4.06-4.17	inf.	.....
Friedelite.....	Ap. 3-48.	Mn ₂ Si ₂ O ₇ .2 H ₂ O.....	53, 3	19, 3	D W	4-5	3.07	.....	VI
Galenobismutite.....	Ap. 3-49.	Pb Bi S ₄	14, 1	7, 2, 73	.....	3-4	6.88	E	M.
Ganomalite.....	Ap. 3-49.	(Pb Mn) SiO ₂	1-1, 7	78	.....	4	4.98	E	M.
Geddanite.....	Ap. 3-51.	CSi, H11, O7, S.25.....	19-5	.....	Z	1.5-2	1.06	E	.....
Gerhardite.....	Sm. '85.	4 CuO, Na ₂ O ₃ , 3 H ₂ O.....	21-4	69, 4, 82	D W	2	3.426	.....	III
Ginilisite.....	Ap. 3-51.	R ₂ (R ₂) ₂ Si ₂ O ₈ + 2aq.....	7, 5	.....	.....	.....	3.404	D	M.
Guanajuatite.....	Ap. 3-51.	Bi ₂ Se ₃	2	66	G	3.5	6.62	.....	Am
Goyazite.....	Sm. '84.	Ca Al phosphate + aq.....	5, 1	.....	Ct	5	3.26	.....	.....
Guejarite.....	Ap. 3-54.	Cu ₂ S + 2Sb ₂ S ₃.....	.....	.....	W	3.5	5.03	F	III
Guitermanite.....	Sm. '84.	10 Pb S 3 As ₂ S ₃	6, 7	73	.....	3	5.94	.....	.....
Hanksite.....	Sm. '85.	4 Na ₂ SO ₄ + Na ₂ CO ₃	23, 1-21	72	H	3-3.5	2.56	.....	VI
Hannayite.....	Ap. 3-55.	H ₂ (NH ₄) Mg ₂ P ₂ O ₁₂ + 8aq.....	.....	.....	D W	.....	1.89	F	V
Hatchettolite.....	Ap. 3-56.	(Ta ₂ O ₅ Ch ₂ O ₅) ₆₇ UO ₁₆ CaO ₈ +.....	5, 8	70	Sub Z	5	4.77-4.90	.....	I
Heldburgite.....	Ap. 3-56.	Composition unknown.....	5	1, 71	.....	.....	.....	inf.	II
Hemafrite.....	Sm. '84.	Mn Arsenate.....	21, 3	.....	U	.....	.....	.....	IV
Hemwoodite.....	Ap. 3-57.	P ₂ O ₅ .49, Al ₂ O ₃ .18, Cu O 7%.....	6, 4	1, 6, 4	Z	4-4.5	2.67	.....	bot
Herregrundite.....	Ap. 3-57.	Basic Cu Sulphate.....	37, 4-6, 4	69, 4, 72	D W	2.5	3.132	.....	IV
Hetaerolite.....	Ap. 3-58.	Zn O Mn ₂ O ₃	2	8, 2-Sub 73	Rad.	5	4.933	inf.	bot
Heubachite.....	Ap. 3-58.	3R ₂ O ₃ + 4aq. R = CONI Fe Mn.....	2	Sub 73	.....	2.5	3.44	inf.	.....
Hofmannite.....	Ap. 3-59.	C ₂ H ₃₆ O.....	23	.....	Tr	.....	.....	.....	.....
Hohmannite.....	A.J.36-156	2 Fe ₂ O ₃ .38O ₃ + 13 H ₂ O.....	8	.....	U	3	2.24	.....	F
Homilite.....	Ap. 3-59.	Fe Ca ₂ B ₂ Si ₂ O ₁₀	2 or 8, 2	7, 70, 72	J	4.5-5	3.34	3	IV
Horsfordite.....	A.J.36-156	Cu ₂ Sb ₂	68, 1	high	.....	4.5	8.812	.....	M.
Hyalotekite.....	Ap. 3-60.	SiO ₂ .40, Pb O25, Ba O21, Ca O7, +.....	1-36, 7	72-78	Ct	5-5.5	3.81	F	Cry
Hydrocerussite.....	Ap. 3-61.	2 Pb CO ₃ + H ₂ O ?.....	1-23	.....	.....	1	.....	.....	VI ?
Hydrocuprite.....	Ap. 2-28.	Cu O H ₂ O.....	56, 5-56, 3	.....	S	soft	2.149-2.174	.....	A
Hydroglauberite.....	Sm. '85.	Mg ₂ CO ₄ + 3aq.....	69, 7	.....	.....	.....	.....	.....	.....
Hydrorhodonite.....	Ap. 3-61.	Rhodonite + aq.....	3, 8	8, 1, 72	Ct	5-6	2.70	E	Cry
Hydrotitanite.....	Catal. 53.	TiO ₂ .H ₂ O (Vd Ca Mg Fe O).....	5, 7	.....	.....	2	3.68	.....	P
Ilialite.....	Ap. 3-62.	Fe ₂ S ₃ O ₁₂ + 12 H ₂ O.....	5	.....	.....	.....	1.812	.....	A
Ilesite.....	Ap. 3-62.	R ₂ SO ₄ + 4aq. R = Mn Zn Fe.....	1	.....	.....	.....	.....	.....	Cry
Iodobromite.....	Ap. 3-63.	2 Ag (Cl Br) + AgI.....	24, 5, 4	.....	B	.....	5.713	.....	I
Ionite.....	Ap. 3-63.	Hydrocarbon.....	8, 5	69	Am	.....	.....	.....	VI
Jeromejefite.....	Sm. '83.	Al ₂ O ₃ .BO ₃ + FeO.....	23	72	.....	6.5	3.28	.....	I
Kentrolite.....	Ap. 3-65.	Pb ₂ (Mn ₂)Si ₂ O ₆	21, 3, 8	.....	E & Ct	5	6.19	.....	III
Konickite.....	Sm. '84.	Fe ₂ P ₂ O ₈ + 6 H ₂ O.....	23	72	.....	3.5	2.3	E	IV
Krennerite.....	Ap. 3-66.	Te Au Ag Cu.....	68, 1-69, 5	73, 75	D E	.....	.....	.....	III ?
Krönkite.....	Ap. 3-66.	Cu O SO ₃ + Na ₂ SO ₃ + aq.....	33, 4	72	Ct	4.5-5	2.3	.....	V ?
Laubanite.....	A.J.35-418	2 Ca Si O ₃ + Al ₂ (SiO ₃) ₂ + 6 H ₂ O.....	61, 1	.....	U rad.	6.5	4.918	.....	VI
Langbanite.....	A.J.34-72.	3 Mg CO ₃ .Mg (OH) ₂ + 21 H ₂ O.....	13, 2	8, 73	Z	4.5	.....	.....	S
Lansfordite.....	A.J.36-156	CO ₂ .18, Mg O23.18, H ₂ O57.79.....	1, 18, 19	72	Cry	2.5	1.54-1.692	.....	S
Laurionite.....	A.J.37-418	Pb (OH) ₂ .Pb Cl ₂	1	.....	E	3.5	.....	.....	III
Lautite.....	Ap. 3-67.	Cu As S.....	13, 2	2, 73	U Rad.	3-3.5	4.95	E	III

NEW SPECIES NAMES.	References.	Composition in percentage or Formulae.	Color.	Streak and Lustre.	Cleavage and Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystal- lization.
Lävenite.....	Sm. '85.....	SiO ₂ 34, ZrO ₂ 32, Fe ₂ O ₃ 6, MnO ₅ , CaO 11.....	21, 8-5	W	3, 51				IV
Lävenite.....	Ap. 3-67.....	Fe ₂ Cl ₂							
Leidyite.....	Ap. 3-68.....	R ₂ (Al ₂)Si ₃ O ₁₃ + 5 aq.....	38, 6-34, 4	1, 70	T	1-2		4	S
Leucochalcite.....	Ap. 3-69.....	Cu ₂ As ₂ O ₉ + 3 H ₂ O.....	4, 1	79				F	Cry
Leucotile.....	Ap. 3-69.....	R ₂ (R ₂)Si ₄ O ₁₉ 8 aq. R = Mg, Fe		78				F	III
Liskeardite.....	Ap. 3-70.....	(Al, Fe ₂) ₃ As ₂ O ₁₄ 16 H ₂ O.....	1		U				M
Lucasite.....	A.J. 32-375	A Vermiculite.....	7, 8	Sub 73, 78			2.6		
Ludlamite.....	Ap. 3-70.....	Fe ₂ P ₄ O ₁₁ 9 H ₂ O.....	75, 4	4, 1, 75	D Ct	3-4	3.12		IV
Mallardite.....	Ap. 3-72.....	Mn SO ₄ + 7 aq.....	23		U				IV
Manganosite.....	Ap. 3-73.....	Mn O.....	37, 4	72	A	5-6	5.18		III
Manganosulphate.....	Sm. '84.....	5 Mn O (Sb As) ₂ O ₅	2		C				IV
Manganosulphate.....	Ap. 3-74.....	RSiO ₃ , R = Mg (a Mn Na).....	19, 5	1		5	3.07	D	VI
Martinite.....	A.J. 35, 418	2Ca ₃ (PO ₄) ₂ + 4Ca H PO ₄ + H ₂ O					2.894		VI
Melanoconite.....	Ap. 3-74.....	Mg ₂ SiO ₄ + H ₂ O.....	7	1, 31	H	3-4	2.53	inf.	Cry
Melanocerite.....	A.J. 37, 417	Complex Cerium Silicate.....	21, 8		Tr				
Melanosiderite.....	Ap. 3-75.....	(Fe ₂) ₂ SiO ₄ 6 H ₂ O.....	2, 3	8-57, 3, 72		4.5	3.391	F	A
Melanotekite.....	Ap. 3-75.....	SiO ₂ Fe ₃ O ₄ Pb O.....	2-2, 7	4, 7, 73, 70	Ct	2.5-3	2.7-3	inf.	VI
Meroxene.....	Ap. 3-76.....	Si ₆ Al ₃ K ₃ H ₃ O ₂₄ + Si ₆ Mg ₁₂ O ₁₂	2	81	W	6	2.54		VI
Microcline.....	Ap. 3-80.....	K ₂ (Al ₂)Si ₆ O ₁₈	1, 4, 9	1, 72	W	5-6			VI
Milarite.....	Ap. 1-10.....	Zeolite.....	23-4	72	F	4			E
Miriquidite.....	Ap. 2-40.....	PbO, Fe ₂ O ₃ , As ₂ O ₃ , P ₂ O ₅ , aq.....	2, 8	44, 5, 72	F	4			VI
Mixite.....	Ap. 3-28.....	Cu ₂₀ Bi ₂ As ₁₀ H ₃₄ O ₇₀	37-6, 4	69, 37, 64	U	2-4	2.66		
Monzonite.....	Ap. 1-11.....	Al ₂ O ₃ 17, FeO 9, CaO 10, SiO ₂ 53 +	69, 7, 4	72	Sub Z	6	3	3	C
Mottamite.....	Ap. 3-83.....	(PbCu) ₃ V ₂ O ₈ + 2 (PbCu) H ₂ O ₂	20, 2	5, 70		3	5.89		Cry
Muckite.....	Ap. 3-83.....	C ₂₀ H ₂₈ O ₂	69, 8, 5			1-2	1.00-5	F	VI
Neociano.....	Ap. 2-84.....	Cu Silicate.....	6		Tr			F	VI
Newberryite.....	Ap. 2-81.....	Mg ₂ H ₂ P ₂ O ₈ + 6 aq.....	19, 5		W				III
Neudorite.....	Ap. 3-84.....	C ₁₈ H ₂₈ O ₂	1-23	59	Z		1.05-1.06	F	Am.
Nicochromite.....	Ap. 2-85.....	2 Ni O, Cr O ₂	5	75					
Nitroglauberite.....	Ap. 2-41.....	4NaOSO ₃ + 6Na ₂ ON ₂ O ₅ + 5H ₂ O	23		U				
Nocerite.....	Ap. 3-85.....	Fe Ca Mg O +	1						
Nordenskiöldite.....	A.J. 37, 417	Ca O Sn O ₂ B ₂ O ₃	24-5		Tr	5.5-6	4.2		
Pennoite.....	Sm. '85.....	Mg B ₂ O ₄ + 3 H ₂ O.....	5, 4, 7 or 3	74	= U	3-4	2.27		G, C
Phillipsite.....	Ap. 3-92.....	Cu OSO ₃ + Fe ₂ S ₂ O ₁₂ + aq.....	33, 4	72	U				M
Phosphuranylite.....	Ap. 3-92.....	(UO ₂) ₂ P ₂ O ₈ + 6 H ₂ O.....	26, 5	31	L				
Picroallumogene.....	Ap. 3-93.....	2 Mg SO ₄ + (Al ₂) ₂ Si ₂ O ₁₂ + 28 aq.....	1, 53, 3	1					40r5
Picroepidote.....	Sm. '85.....	Mg Epidote.....	1-5			6		inf.	IV
Pilinite.....	Ap. 3-93.....	(Ca Li ₂) (Al ₂) Si ₂ O ₁₅ + aq.....	1-23	79	D W		2.263		III
Pilotite.....	Ap. 3-94.....	Mg ₂ (Al ₂)Si ₁₀ O ₂₇ 15 H ₂ O.....	1-19, 7		U				
Plagiocitrite.....	Ap. 3-94.....	R ₂ SO ₄ + (R ₂)SO ₄ + 9 aq, R = Al Fe	26, 5						40r5
Plagioclaurite.....	Sm. '85.....	4 Mn O As ₂ O ₈ + H ₂ O.....	5, 3	82			4.085		
Polydymite.....	Ap. 3-95.....	Ni ₄ Si ₅	69, 7	75, 73	D J	4.5	4.81	F	I
Porenyte.....	Ap. 3-96.....	C ₂₂ H ₃₆ O ₄	22, 69, 4				.85-.95		
Protovermiculite.....	This Cat.	SiO ₂ 33, Al ₂ O ₃ 15, Fe ₂ O ₃ 6 Mg O ₂ , H ₂ O 3.....	7, 4	Sub 73	L	2	2.269	4	Mia
Pseudobrookite.....	Ap. 3-97.....	TiO ₂ 53, Fe ₂ O ₃ +.....	8-2, 3	5, 70, 78	H to sub Z	6	4.98		III
Pseudocautunite.....	Ap. 3-97.....	Pb Cl ₂ + K Cl.....	5						Cry
Pseudonatroilite.....	Ap. 3-98.....	SiO ₂ 63, Al ₂ O ₃ 15, CaO 9, H ₂ O 15	23-1	72-31		5-6		3	III
Psittacinite.....	Ap. 3-98.....	Pb O 42, Cu O 15, V ₂ O ₅ 15, aq +	4-34, 4						Cry
Queensdittite.....	A. J. 36, 152	2FeO ₂ H + 8 Fe ₂ (SO ₄) ₃ + 10 aq.....	3, 58		Tr				IV
Randite.....	Ap. 3-106.....	Ca ₂ U ₂ CaO ₂₀ + 8 H ₂ O.....	5	7	Cry				Oel
Reddingite.....	Ap. 3-102.....	Mn ₂ P ₂ O ₈ + 3 aq.....	53, 9-5, 1	72-Sub 70	H	3-3.5	3.1	2	III
Reinitite.....	Ap. 3-102.....	Fe W O ₄	2, 8	8 Sub 73	H	4	6.640		II
Rinkite.....	Sm. '84.....	Ce Ca Ti O ₃ SiO ₂ Na F +.....	5, 8-46, 5	72-78			3.46		IV
Rogersite.....	Ap. 3-104.....	Y O 60 Cb O ₂ 18 H ₂ O 17%.....	1	31	Cry	3.5	3.313		A
Roscoelite.....	Ap. 3-104.....	4 Al VO ₃ + K ₄ Si ₈ O ₂₀ + aq.....	21, 8, 4	31-Sub 73	D W	soft	2.93	E	M
Rosenbuschite.....	A.J. 35, 417	Zr pectolite.....	56, 7			5-6	3.3		IV
Sarkinite.....	Sm. '85.....	See Polyarsenite.....	21, 3	78	W	4-5			
Schneebergite.....	Ap. 3-107.....	Ca OSb O ₃ +.....	45, 5	72-71	N J Z	6.5	4.1	inf.	I
Schraufite.....	Ap. 3-107.....	Cu ₁₁ H ₁₆ O ₂	32, 3		Semi Z	2-3	1-1.12		A
Semseyite.....	Ap. 3-108.....	Sb Pb.....	7	73					Cry
Serpierite.....	Ap. 3-109.....	Zn O Cu OSO ₃	4-6		Tr				III
Siderazot.....	Ap. 3-109.....	Fe ₂ N ₂	12	73					A
Sideronatrite.....	Ap. 3-109.....	Na ₂ SO ₄ (Fe) S ₂ O ₈ + 6 aq.....	5	19, 5-5, 1			2.5		Cry
Siderophyllite.....	Ap. 3-80.....	R ₂ (R ₂)Si ₃ O ₁₂ , R = Al Fe K +.....	2, 4	75	F	3.2	3.1	2.5	IV
Silicate of Yttria.....	804.....	SiO ₂ , Yt O.....	8			5-6	4.391	inf.	
Sipylite.....	Ap. 3-110.....	R ₂ M ₂ O ₈ , M = Cb Eb +.....	8, 2-8, 56	8-7, 70	Ct Z H	6	4.89	inf.	II
Sperryllite.....	A.J. 37, 67.....	Pl As ₂	14, 1		Z H	6-7	10.6		inf.
Sphacrocobaltite.....	Ap. 3-111.....	Co CO ₂	20, 2-53, 3	42, 3	Rad	4	4.02-4.13		Cry
Spodiosite.....	Ap. 3-112.....	5Ca ₃ P ₂ O ₈ + 4 Ca F ₂	47, 7-8	1, 72, 61	H	5	2.94	5	III
Strengite.....	Ap. 3-116.....	(Fe ₂) ₂ P ₂ O ₈ + 4 aq.....	42, 3-23	5, 1, 72	J Rad	3-4	2.87		III
Strenite.....	A.J. 33, 80.....	(Na ₂ Mg)SO ₄ + Al ₂ Si ₂ O ₁₂ + 24 H ₂ O.....							Ad.
Sulphohalite.....	A.J. 36, 463	3 Na ₂ SO ₄ , 2 Na Cl.....	69, 4, 5			3.5	2.49		IV
Stützite.....	Ap. 3-117.....	Ag ₄ Te.....	11, 7, 3	2, 11, 7, 73	H to sub Z				E
Synadelphite.....	Sm. '84.....	Mn Arsenate + aq.....	22-8	72-Sub 73		4.5	3.46-3.50		IV
Szabolite.....	Ap. 3-118.....	Ca ₂ (Fe ₂) ₁₁ Si ₃₅ O ₁₀₅	55, 5-7, 3	10, 3, 72	Tr	6-7	3.505	D	A.S
Sznikite.....	Ap. 3-118.....	Mn SO ₄ + H ₂ O.....	1-53, 3		G	1.5	3.15	inf.	IV
Thaumasite.....	Ap. 3-120.....	CaSiO ₃ + CaCO ₃ + CaSO ₄ + 14 aq.....	1	78, 66	Sub Z	3.5	1.877		M
Titanomorphite.....	Ap. 3-122.....	Ca Ti ₂ O ₆	1		U				IV
Toconallite.....	Ap. 2-56.....	Ag I + H ₂ SO ₄	19 5-4	5	G	soft		S	A
Triplidite.....	Ap. 3-125.....	R ₄ P ₂ O ₈ H ₂ O, R = Mn Fe.....	5-3, 8	1, 72, 78, 71	W Sub Z	4-5-5	3.697	2	IV

NEW SPECIES NAMES.	References.	Composition in percentage or Formulae.	Color.	Streak and Lustre.	Cleavage and Fracture.	Hardness.	Specific Gravity.	Fusibility.	Crystallization.
Trippkeite.....	Ap. 3-125.	(n Cu O, As ₂ O ₃).....	6, 4	75	=	.....	.....	E	II
Ysonite.....	Ap. 3-126.	(Ce, La, Di) ₂ F ₁₆	19, 59-5	1, 72, 70	D Ct	4.5-5	6.12-6.14	inf.	VI?
Antahite.....	Sm. '83.....	Near Asphaltum.....	2	2, 74, 75	F Z	2-2.5	1.06-1.07	1	M
Tranocircite.....	Ap. 3-127.	Ba U ₂ P ₂ O ₁₂ + 8 H ₂ O.....	5	.....	D W	.....	3.5	.....	III
Uahite.....	Sm. '84.....	3 Fe ₂ O ₃ , 3 SO ₃ + 4 H ₂ O.....	.....	79	.....	.....	.....	.....	VI
Valaitite.....	805.....	CH O.....	51, 2	2, 74	H	1	.....	E	M
Vanuxemite.....	This Cat.	Si O ₂ Zn O Al ₂ O ₃ H ₂ O.....	1	66	= Z	2.5-3	2.5	E	M
Vestan.....	806.....	Si O ₂.....	.....	.....	.....	.....	2.65	.....	V
Vatrevillite.....	Ap. 3-131.	R S O ₄ - 2 aq. R = Ca K Na Mg.....	60, 1	79	U	.....	1.81	D	3 or 1
Vebskyite.....	A. J. 34, 72.	Si O ₂ 35, Al ₂ O ₃ Fe ₂ O ₃ 10, aq 10, Mg O 22 +.....	2	7, 8	.....	.....	1.771	.....	.....
Verthemanite.....	Ap. 3-131.	Al ₂ SO ₄ + 3 H ₂ O.....	1	.....	.....	.....	2.8	inf.	M
Cantharsenite.....	Sm. '84.....	Mn Arsenate + aq.....	24, 5	.....	.....	.....	.....	.....	.....
Zincaluminite.....	Ap. 3-133.	2 Zn SO ₄ + 4 Zn H ₂ O ₂ + 3 A P ₂ H ₂ O ₄ + 5 aq.....	1-6	.....	.....	2.5-3	2.26	.....	6 or 3
Zinnwaldite.....	Ap. 3-77.....	R ₈ Si ₄ O ₁₂ Li Fe Mica.....	4, 7-7, 1	31	D W	2.5-4	2.84-3	2-2.5	III
Zonochlorite.....	This Catalogue, see full description.....	.....	Different shades of 4	19, 4	.....	6.5-7	3.113	D	M
Zunyite.....	Sm. '84.....	Al ₂ O, 3 Si O ₂ + aq.....	23, 2	72	.....	.....	2.875	E	I
29 Titanite.....	383.....	CaO + TiO ₂ SiO ₂	8, 7, 5, 4, 2	1, 71	I	5-5,	4.4-3.56	.....	IV

Sulphohalite.

In the Am. Journal of Sciences and Arts for December, 1888, Messrs. Hidden and Mackintosh give an account of a new sodium sulphato-carbonate, from which we condense as follows: "It is transparent with a faint greenish-yellow color; specific gravity, 2.489; hardness, about 3.5; slowly soluble in water, and unaltered in moderately dry atmosphere. Analysis: Cl 13.12, SO₃ 42.484, Na₂ CO₃ 1.77. Calculating the Cl and S as combined with Sodium only, we get Na Cl 21.624, Na₂ SO₄ 75.411, Na₂ CO₃ 1.75. Formula: Na₂ (3 SO₄, 1 Cl₂), or 3 Na₂ SO₄, 2 Na Cl.

"Except the rare Connellite from Cornwall we know of no other species related in composition. We learn from Dr. A. E. Foote, in whose stock of Borax Lake minerals we found a single specimen of the mineral, that he had visited the locality the past summer, and that about one month before his arrival the company had been testing the immense alkaline deposit of Borax Lake (San Bernardo Co., Cal.), and had drilled an 8-inch hole to a depth of over 100 feet. At a depth of 35 feet a small cavity was discovered, from which were pumped out through the drill-hole the sulphohalite with some very remarkable crystals of Hanksite. But three specimens are known to us." (Three others have since been discovered.)



A. E. FOOTE.

Amazon Stone, Twinned Crystal,
Pike's Peak, Col.

TABLE OF COLOR.

The numbers given in these columns are Dana's Species Numbers; see Table of Species.

The following are the abbreviations that indicate color:

1 White; 2 black; 3 red; 4 green; 5 yellow; 6 blue; 7 gray; 8 brown; 9 pink; 10 copper; 11 lead; 12 steel; 13 iron; 14 tin; 15 brown; 16 brass; 17 purple; 18 plumbeous; 19 pale; 20 violet; 21 dark; 22 dirty; 23 sulphur; 24 aurora; 25 cherry; 26 cochineal; 27 pomegranate; 28 pearl; 29 hyacinth; 30 saffron; 31 olive; 32 leek; 33 verdigris; 34 emerald; 35 grass; 36 pistachio; 40 sky; 41 indigo; 42 blue; 43 apple; 44 ochre; 45 honey; 46 straw; 47 ash; 48 flash; 49 lavender; 50 raven; 51 pitch; 52 wood; 53 rose; 54 sea; 55 hair; 56 orange; 57 brick; 58 violet or purple; 59 wax; 60 snow; 61 liver; 62 oil; 63 clove; 64 milk; 65 asparagus; 66 dull; 67 tin; 68 silver; 69 colorless; 69 light; (—all colors). Letters indicate unnumbered Species, which may be found on page 57 of the Catalogue.

1	1	1	1	2	3	3	4	4	4	5	5	5	6	7	7	7	8	8
1A	295A	490	681	25	377A	12	392	56	415	595A	1	444	656	34	8	222	575	25
2	297	431A	685	32	411	19	394	141	415A	597	22	415B	659A	100	5	223	592	31A
4	294	432	688	40	425	20	404	112	416	597A	27	417B	660	153A	6	234	595A	56
6	300	433	689	40C	435	25	404E	159	417	614	28	420	663	154	13	236	597	60A
8	301	446	695	56	437	51	411	153A	420	615	49	420B	671	160	14	237	597A	67
9	302	451	697	58A	438	57	413	173	422D	615A	54	420C	672	179	15	238	599	67
10	303	459	711	59	439	4	414	174	422	622	56	420G	678	183	16	240	632	68A
11	304	470A	715	60	440	71	417	183	423A	631A	75	423A	682	203	29	246	638	76
14	305	490	716	70	443	72	418	185	423B	636	77	424	683	214A	29A	233	640	81A
17	309	490D	717	76	452	85	420	203	424	641	78	425	684	21D	30	253A	641	162
18	310	490F	718	89	456	100A	420A	210	426	644	79	428	684	238B	31	257	650	146
19	310A	490G	719	99	456A	115	420E	222	428	659A	90	429	685	254	32	258	654	173
20	310B	492	720	100	458	117	422	225A	429A	652	116	430	687	273	33	262	713	183
21	310C	493	723	108	458A	118	427	234	430	664	121A	430A	690	287	34	263	717	190
22	311	500	724	111	458B	127A	425	235	436	668	133	431A	691	299	38	270	718	192
35	512	501	726	117	468	132B	448	236	441	669A	139	442B	692	300	40	272	719	193
36	513	502	727	120	469	138	450	239	442B	675	141	445A	693	305	40C	272E	720	194
37	314	503	728	122B	473	144	459	238	443	694	142	445C	695	306	42	275	721	195
48	511A	503B	729	127	474	141A	461	240	444	696	143	446	696	307	43	280	722	196
50	516	504	730	130	475	146	470	242	445	701	144	447	708	320	44	285	723	198
56	519	515	733	131	476	148A	471	243	445C	702	145	447A	710	324	45	293	725	203
73	520	516	735	132	477	149	490A	245	447A	704	146	448	711	325	46	294	727	204
82	521	517	736	134	478	161	492	246	448	705	148	470A	712	326	47	295A	728	205
83	522	518	737	133	478A	162	493	247	448A	706	144A	472	718	327	44A	298	730	207
83A	523A	520	738	164	479	169	496	250	449	709	150	477	719	346	44B	299	736	208
84	524	520B	739	178	480	172	499	251A	449A	718	152	484	720	346A	53	300	737	209
85	524	520C	740	183	481	176	500	264	450	723	161	490C	723	348	55	304A	738	213
86	525	522	741	180A	482	183	503A	266	452	728	162	490D	724	331	58	305	741	215A
88	526	523	742	181	489	194	507	273	453	731	169A	491E	728	333A	59	308	742	216
90	527	528	744	182	483	197	506	276	454	737	176	491	730	344	62	309	743	218
91	528	549	745	183	484	198	506A	276A	454A	739	177	492	731	372	62A	310	745	219
92A	531	550A	746	184	485	202	531	279	455	751	182	494	732	374	61A	311	749	220
93	533	554	748	185	486	204	532	280A	457	751B	183	495	732A	393	65	312	772	221
93A	535A	556	749	186	490B	207	549	282	458	754	193	496	735	417	65A	314A	781C	222
94	530	564	753	187	499	208	556	288A	458A	755	198	497	741	418	66A	315	798	225
95	531	565	772	188	500	210	561	290	460	755A	201A	501	745	453	73	316	802	226
96	532	571	779	189	501	212	562	293	462	772	212	504	749	462	74	321	813	228
100A	537A	574	780	190	500	218A	574A	295	464	839C	216	506	755A	479	81	324	820A	229
102	534	590	784	190	500	218A	574A	295	464	839C	216	506	755A	479	81	324	821	230
135	575	591	785	192	582	226	575	299	465	An	222	507A	758	470A	81A	377A	824	231
137	576	592	786	193	585	228	576	300	466	Ba	224	509	772	492	84	382	825	232
138	576A	593	794	194	606	231	577	302	467	Ki	225	510	773	498	86	383	826	233
139	577	594	795	195	610	232	580	304	469	Ma	225A	515	778	499	87	384	827	234
145	578	595	796	196	612	236	581	305	470	Mi	227	516	779	503A	88	385	828	235
146A	579	595A	797	198	618	241	611	307	492	Mo	228	518	783	526B	92	401	829	236
147	581	596	805	199	620	240	612	318	493	Diab	232	531	793	542	95	404	830	237
150	582	597	806	200	623	255	616	319	494	Psit	234	532	798	547	97	404A	831	238
151	583	598	821	201	646	252	617	315	503	Rose	237	535	799	551	98	405	832	239
160	584	599	822	202	696	232A	617A	316	504	Rose	237	535	799	551	98	405	833	240
163	585	600A	824	204	701	263	619	319	507	Euch	254	537	799A	552	99	406	834	241
163A	586	601	832	217	675	266	623A	320	508		259A	530A	799B	554	101	407	835	242
164	587	601A	834	218	751A	269	624	323	525		265	554	800	554C	103	411	836	243
165	588	602	835	219	816	270	632	324	527		266	556	801	563	104	412A	837	244
166	589	603	836	220	827	272	643	325	529		267	557	802	574B	105	413A	838	245
167	590	604	837	221	827	272A	643	325	533		268	558	803	595A	106	417	839	246
168	591	614	838	222	827	272B	643	325	533		271	559	813	630	107	418	840	247
169	592	617	839	223	827	272C	643	325	533		272	560	818	631	109	419	841	248
170	593	626	840	224	827	272D	643	325	533		273	561	819	632	110	420	842	249
173	594	627	841	225	827	272E	643	325	533		274	562	820	633	111	421	843	250
219	635	629	842	226	827	272F	643	325	533		275	563	821	634	112	422	844	251
220	636	630	843	227	827	272G	643	325	533		276	564	822	635	113	423	845	252
221	637	631	844	228	827	272H	643	325	533		277	565	823	636	114	424	846	253
222	638	632	845	229	827	272I	643	325	533		278	566	824	637	115	425	847	254
223	639	633	846	230	827	272J	643	325	533		279	567	825	638	116	426	848	255
224	640	634	847	231	827	272K	643	325	533		280	568	826	639	117	427	849	256
225	641	635	848	232	827	272L	643	325	533		281	569	827	640	118	428	850	257
226	642	636	849	233	827	272M	643	325	533		282	570	828	641	119	429	851	258
227	643	637	850	234	827	272N	643	325	533		283	571	829	642	120	430	852	259
228	644	638	851	235	827	272O	643	325	533		284	572	830	643	121	431	853	260
229	645	639	852	236	827	272P	643	325	533		285	573	831	644	122	432	854	261
230	646	640	853	237	827	272Q	643	325	533		286	574	832	645	123	433	855	262
231	647	641	854	238	827	272R	643	325	533		287	575	833	646	124	434	856	263
232	648	642	855	239	827	272S	643	325	533		288	576	834	647	125	435	857	264
233	649																	

TABLE OF COLOR.

53

1	10	11	11	12	12	13	14	15	16	18	19	19	21	21	22	23	23	23	24
1A	12	15	112	3	119	13	7	39	75	63	56A	694	57	454A	410	137	310	715	22
24	49	29	112A	5	121	25	17	54	75	81A	90	727	89	467	412A	138	315	724	224
24	51	30	113	6	121A	41	18	66	78		214A	801	117	468	501	151	316	727	509
29	71	42	122	16	132A	52	19	68			252A	813	122A	507		163A	325	780	597
30A	72	43	123B	29	180A	58A	21	77			275	Ma	127A	526		163B	327	805A	573
33	132B	44	123	31	205	60	37	79			288	To	141	543		168	361	824	683
37	230	44A	124	33	Cl	89	48	98A			296		173	547		175	370	833	712
745		44B	125	38	Ta	108	82	211			335		178A	564		231	382	834	
		45	127A	53		120	83	230A			448A		294	567		232	383	834	
		46	128	62		127	85A	292			519		238B	568		234A	385	834	
		47	129	62A		130	93A	407			521		242	574A		238	387	834	
		58	134	74		131	96	459A			525		261	582		254	388	834	
		65	135	80		132	102				552		290	622B		256	393A	834	
		65A	223	81		182					555		368	623		265	491	834	
		69A		81A		183					559		400	623A		267	523	834	
		92A		87		188					581		499	625		272	562	834	
		191		97		189					582		497	631		295A	635A	834	
		103		98		199					574B		444	636		297	682	834	
		105		104		201					614A		417B	675		391	654	834	
		106		110		400B					685		419	732		302	650A	834	
		107		113A		400B					690		449A	781A		303	661	834	
		109		114		485					693		454	798		305A	673	834	
25	26	27	29	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
26	27	226	118	149	115	395	259	153	533	138	462	174	154	109	526	280A	199	60	373
573	143	277	172	245	612	346A	288A	376B	541	133	308	276	542	525	668	317	310	152	692
573B	622	337		420F	642	551	346B	428	545	339	498	563	499	637		354	614	328	
710				757			348	456	546	326	514	460	669			415	631	371D	
							349	441	554B	345	518	538				415		501	
							409	444	583	416	565	615				415		513	
							410	455	636	420A	572	709				415		517	
							419	457	709	445	706					529		611	
							454	490	751B	463	751					529		614	
							457	534		534						535		826	
							469	536		538						535A			
							477	540		540						535A			
							515	533		541						535A			
							536	568		545						535A			
							535	572		418						535			
							572	615		544						774			
							615			572						Da			
							620			701						Ma			
							622			705									
							644			717									
										721									
										755									
47	48	49	51	52	53	54	56	57	58	59	61	62	63	64	66	67	68	71	
262	270	418A	253	339	241	409	23	323A	238B	271	166	442	393	285	147	278	122A	6	122B
280	313	491	233A		275	455A	28	674A	537	573A	300C	458	411	330	232	231	161	9	237A
421	314	526B	435		294	412	39	428	673	577	404A	520B		337	493	315	191	10	246A
721	316		Va		296	502	116	656	231	615				496	490F	335		35	
	337				370		176		159	732A				632A	491G	441		36	
	419				401E		224			773				799B	534C	455		50	
	637	50			406		353								574	725		91	
					427		503A								690A	803		92A	
					523A		531								Ge			93	
					657		659											94	
					722		837											401A	
							Hy												

MAZAPILITE: A NEW SPECIES.

Proceedings of the Academy of Natural Sciences, Philadelphia, July 3, 1888.

Prof. George A. Koenig announced the occurrence of this mineral in Zacatecas, Mexico, in the district of Mazapil. The crystals are well developed in all directions. They are of orthorhombic symmetry, exhibiting a flat prism in combination with a brachydome and a pyramid. The color is deep brown red, nearly black, but transparent at the edges. The hardness is nearly 7, its streak greenish yellow. The specific gravity, 3.567. In closed tube a white crystalline sublimate is produced (As^2O_3) and water, while the powder turns dark brown. B.B. fuses at 3 to a black globule. On charcoal the

odor of arsenic is observed. With borax, only iron reaction. Easily soluble in warm HCl. A preliminary analysis proves the mineral to be a *calcium ferric arsenite*. The structural formula must be made the subject of a more thorough investigation, which the speaker proposes to carry out this fall. This mineral is the first representative of the class of pure arsenites in nature, and is therefore of marked interest. For the material the author is indebted to the indefatigable zeal of Dr. A. E. Foote, who is now in Mexico. (Obtained by me from the well-known Mining Engineer, Sr. Francisco Zarate, A. E. F.)

A few small crystals of the above, 25c. to \$1.00 each.

TABLE OF HARDNESS.

SCALE OF HARDNESS.—1 Talc; 2 Gypsum; 3 Calcite; 4 Fluorite; 5 Apatite; 6 Feldspar; 7 Quartz; 8 Topaz; 9 Corundum; 10 Diamond. Price of 9 Specimens in box 50 cents; with file, magnet and porcelain plate for testing streak \$1.00. The numbers are those given in the "Table of Specimens."

H. < I.	1-1.5	1.5-2	2-2.5	2.5-3	3-3.5	3.5-4	4-4.5	4.5-5	5-5.5	5.5-6	6-6.5	6.5-7	7-10
409	34	31	1	12	17	17	3	13	83	94	75	231	49
53	25	30	2	119	132	39	68	149	85	93	90	7	35
123	140	25	131	29	39	37	199	643	71	30	263	26	26
527	683	22	112	112	37	18	205	499	94	186	186	597	28
218 E	224	26	130	108	18	101	586	496	93	284	259 A	262	220
404	602	27	29	104	78	125	752	597	81	298	260	614	179
419	447	226	129	44	66	66	80	492	217	217	196	285	191
40 C	419	139	104	49	199	199	597	237	202	202	188	320	183
122 B	401	117	64	61	729	494	386	386	181	188	7	276	29
149	400	100	20	199	633	493	459	269	206	181	474	269	23
336 A	452	526	199	221	178	617	380	361	190	189	180	273	251
793 A	99	664	22	118	407	536	461	411	610	180	240	202	28
830 F	63	524	229	642	290	153	118	461	301 A	284	21	324	272
447 A	218 E	224	669	672	726	701	7.2	614	597	298	248	323	254
447 B	141	591	226	294	632	172	719	5	339	241	597	259	185
600 A	546	653	660	738	630	751	721	93 A	370	304 A	363	192	34
Ap. 2-58	685	137	674	599	631	553	411	88	383	597	311	193	269
528	736	654	138	630	168	721	110	539	199	563 B	244	333	326
778	737	516	656	164	413	168	38	544	529	527	243	310	267
779	673	688	640	168	374	543	97	545	247	378	316	286	24
780	594	119	402	294	715	392	55	425	229	579	315	331	8
781	447	401	293	212	747	394	77	369	324	305	314	282	53
782	694	210	749	708	346	241	200	249	723	304	280	257	568
793	605	432	346	346	69	551	567	495 A	266	299	276	4	855
796	420	218 B	414	411	411	724	538	370	204	238	324	74	
797	375	15	289	288	459	716	535	381	206	324	323	284 A	
803 A	418	32	293	429	113	718	289 A	377	202	307	318	309 A	
820	337	92	430	148	105	728	499	341	512	309	485	Ap. 2-63	
821	419	21	331	45	132	722	425	493	411	458	192	281	
829	429 A	136	47	41	45	717	335	550 A	234	194	98	232	
831	404 E	145	65	46	120	717	335	550 A	234	246	84		
814 B	454 A	133	458 B	43	106	56	753	228	235	235	188 A		
404	335 A	346	21	58	111	346	495 A	560	95	86	187		
405	288 A	548	98	107	101	411	371	161	92	72	182		
406	772	570	58 A	128	79	459	389	345	92 A	89	263		
410	784	590	108	60	51	127	372	366	145	82	261 A		
455 A	785	673	114	62	66 A	35	283	490	530	478	240		
807	671	671	9	9	510	52	553	81 A	242	483	563		
821	807	566	221 A	12	619	75	375	83 A	503 A	242	271		
822	821	520 A	650	197	643	421	181	171	495	270	344		
830 B	445 A	142	700	150	150	54	163 A	370 A	307 A	307	253		
830 C	495 B	197	733	616	619	227	268	306	306	107 B	310		
831	420	638	611	620	6	228	362	308	308	255 A	305 A		
401 A	375	151	635	153 A	540	731	531	297	310 D	277			
404 E	418	642	644	752 A	701	161	554 B	274	396	314 A			
430 C	465	154	621	541	752 A	160	554 C	468	228	313			
430 A	322 A	772	644 A	622	641	346 A	561	332	Ap. 1-11	374			
454	357	381	547	691	692	408	577	265	549	568			
455	449	558	702	684	596	490	488	373	554 C	481			
456	449	558	702	684	596	490	488	373	554 C	481			
457	449	558	702	684	596	490	488	373	554 C	481			
458	449	558	702	684	596	490	488	373	554 C	481			
459	449	558	702	684	596	490	488	373	554 C	481			
460	449	558	702	684	596	490	488	373	554 C	481			
461	449	558	702	684	596	490	488	373	554 C	481			
462	449	558	702	684	596	490	488	373	554 C	481			
463	449	558	702	684	596	490	488	373	554 C	481			
464	449	558	702	684	596	490	488	373	554 C	481			
465	449	558	702	684	596	490	488	373	554 C	481			
466	449	558	702	684	596	490	488	373	554 C	481			
467	449	558	702	684	596	490	488	373	554 C	481			
468	449	558	702	684	596	490	488	373	554 C	481			
469	449	558	702	684	596	490	488	373	554 C	481			
470	449	558	702	684	596	490	488	373	554 C	481			
471	449	558	702	684	596	490	488	373	554 C	481			
472	449	558	702	684	596	490	488	373	554 C	481			
473	449	558	702	684	596	490	488	373	554 C	481			
474	449	558	702	684	596	490	488	373	554 C	481			
475	449	558	702	684	596	490	488	373	554 C	481			
476	449	558	702	684	596	490	488	373	554 C	481			
477	449	558	702	684	596	490	488	373	554 C	481			
478	449	558	702	684	596	490	488	373	554 C	481			
479	449	558	702	684	596	490	488	373	554 C	481			
480	449	558	702	684	596	490	488	373	554 C	481			
481	449	558	702	684	596	490	488	373	554 C	481			
482	449	558	702	684	596	490	488	373	554 C	481			
483	449	558	702	684	596	490	488	373	554 C	481			
484	449	558	702	684	596	490	488	373	554 C	481			
485	449	558	702	684	596	490	488	373	554 C	481			
486	449	558	702	684	596	490	488	373	554 C	481			
487	449	558	702	684	596	490	488	373	554 C	481			
488	449	558	702	684	596	490	488	373	554 C	481			
489	449	558	702	684	596	490	488	373	554 C	481			
490	449	558	702	684	596	490	488	373	554 C	481			
491	449	558	702	684	596	490	488	373	554 C	481			
492	449	558	702	684	596	490	488	373	554 C	481			
493	449	558	702	684	596	490	488	373	554 C	481			
494	449	558	702	684	596	490	488	373	554 C	481			
495	449	558	702	684	596	490	488	373	554 C	481			
496	449	558	702	684	596	490	488	373	554 C	481			
497	449	558	702	684	596	490	488	373	554 C	481			
498	449	558	702	684	596	490	488	373	554 C	481			
499	449	558	702	684	596	490	488	373	554 C	481			
500	449	558	702	684	596	490	488	373	554 C	481			
501	449	558	702	684	596	490	488	373	554 C	481			
502	449	558	702	684	596	490	488	373	554 C	481			
503	449	558	702	684	596	490	488	373	554 C	481			
504	449	558	702	684	596	490	488	373	554 C	481			
505	449	558	702	684	596	490	488	373	554 C	481			
506	449	558	702	684	596	490	488	373	554 C	481			
507	449	558	702	684	596	490	488	373	554 C	481			
508	449	558	702	684	596	490	488	373	554 C	481			
509	449	558	702	684	596	490	488	373	554 C	481			
510	449	558	702	684	596	490	488	373	554 C	481			
511	449	558	702	684	596	490	488	373	554 C	481			
512	449	558	702	684	596	490	488	373	554 C	481			
513	449	558	702	684	596	490	488	373	554 C	481			
514	449	558	702	684	596	490	488	373	554 C	481			
515	449	558	702	684	596	490	488	373	554 C	481			
516	449	558	702	684	596	490	488	373	554 C	481			
517	449	558	702	684	596								

CLASSIFICATION OF SPECIES ACCORDING TO CRYSTALLINE FORM. 55

NAMES OF SYSTEMS.—I. Isometric; II. Tetragonal; III. Orthorhombic; IV. Monoclinic; V. Triclinic; VI. Hexagonal; A. Amorphous; F. Fibrous; S. Stalactitic; M. Massive; C. Compact; Cry. Crystalline. Where a species occurs under several heads, we give it only under the most important as a rule.

CRYSTALLOGRAPHIC SERIES (Illustrating the six systems).—25 specimens, in box, \$1.00; larger, \$2.50 to \$5.00; 50 specimens, in box, \$5.00; or larger, \$10.00 to \$25.00.

I.	I.	II.	III.	III.	III.	IV.	IV.	V.	VI.	VI.	A.	M.	M.
1	137	16	22	294	634 A	26	640	241	6	715	64 A	23	449
2	138	78	27	295	635	34	641	242	7	716	36	37	458 B
3	138 A	99	28	319	635 A	98	642	285	14	717	73	38	460
4	139	136	29	322	636	108	644	286	17	718	209	39	463
5	140	150	30	325	643 ?	109	653	310	18	719	216	42	466
8	141	163 B	35	333	645	114	654	310 A	19	720	218 A	43	476
9	142	166	58	335 ?	650	115	656 A	311	20	721	247 D	46	478 A
10	149	167	59	341	652	116	658	312	21	722	279	47	490 A
12	154	192	60	349	655	128	659 A	314	25	723	349 A	50	501
13	159	193	61	361	656 ?	168	664	315	31	731	342	51	508
15	162 ?	194	62	362	661	169	667	324	32		374	53	515
24	163 A	195	63	363	662	171	670	381	33		375	65	526 C
40	172	196	83 A	372	663	200	671	503	64		404	67	538
40 C	173	272	90	373	666	226	678 ?	520 C	65		404 E	68 A	539
41	174	272 C	91	375 B	695	237	680 ?	541 A	68		4 9	72 A	549
44	178	272 F	92	377	701	238 A	682	594	69		413	79	550
45	180 A	273	92 A	378	702	239	687	639	70		416	80	551
48	181 A	274	93	384	724	248	700		71		422	81 A	563
49	182	296	93 A	388	726	240	705		72		425	98 A	567
52	183	297	94	389	727	243	730		100		435	103	571
54	184	298	95	390	728	244	736		117		437	122	574
55	185	299	96	392	729	245	738		118		439	122 B	576
56	186	300	97	393	732 A	247	739		133		440	132 B	581
56 A	187	301	101	393 A	737	247 C	740	Cry.	143		442	144	592
75	188	302	102	397	745	218	751		152		462	146	597 A
76	188 A	303	105	399		276	752		161		470 A	147	612
77	189	321	106	401		276 A	756	263	175		507 A	148	619
81	190	328	107	401 D		277	772	338	176		500	153 A	659
82	219	370	112	418		278		427	179		526 B	160	682 A
83	220	371	113	429		281		453	180		554	165	677
84	256	470	119	419		313		651	181		545	201 A	679
85	269	475	120	445		316		750 A	210		586	213	688
86	270	483	121	417 ?		323			212		587	217	690
87	271	484	122 A	459		325			214		615 A	222	692
88	305	490	124	451		327			215		618	223	693
89	306	505	129	473		330			231		684 A	228	695
110	307	506	130	474		331			231 A		694	229	707
111	318	572	131	477		336 A			254		710	238 B	712
125	309	572 A	132	478		337			255		732	250	741
127	309 A	614	1 2 A	479		339			256		755	252	742
134	336	616	135	480		343			257			260	749
	355	617	145	481		343 A			258			275	751 A
	396	617 A	148 A	482		348			289			279 B	751 B
	383	660	151	485		379			290 ?			281 A	
	385	733	153	498		394			290 A			295 A	
	471		163	499		395			304			310 B	
	472		164	500		445 D			304 A			310 C	
	558		177	502		450			320			314 A	
	597		191	504		457			344			323 A	
	598		198	510		458			345			332	
	646		199	516		456			369			334	
	673	S.	203	517		495			370 A			338 A	
	674		204	526 A		496			382			340	
	675		205	535		497			386			341 A	
	676		221	536		499 A ?			387			342	
			218 E	537		503 A			445 A			346 A	
			421	540		518			445 C			347	
			430 C	543		519			448			350	
			580	546		520			451			364	
			715	553		520 B			452 ?			377 A	F.
			747	554		521			456			380	
				560		522			456 A			405	
				564		523 A						406	247
				565		524						408	249
				568		525						412 A	323
				573		526						414	357
				573 C		527						414 A	358
				583		529						415	380
				590		530						415 A	381
				610		531						415 B	407
				611		541						417	411
				613		542						420 D	441
				620		547						420 H	459
				624		551						423 A	570
				627		557 ?						423 B	595
				629		573 A						429 A	596
				630		573 B						431	602
				631		585						443	628
				632		599						446	681
				633		606						448 A	685
				634		634 B							

TABLE OF SPECIFIC GRAVITY.

Specific Gravity ranges from Water 1 to Iridosmine 19-21. 25 Specimens, illustrating Specific Gravity, in box \$1.00
50 specimens, mostly crystalized, in box \$5.00.

<-2	2-2.5	3-3	2.5-3	3-3.50	3-3.50	3.50-4	4-4.5	4.5-5	5-5.5	5.5-6.5	6.5-7.5	7.5-21
25	669	526	447 B	298	292	298	132	29	125	17	83	13
22	683	524	344	553	242	284	104	125	49	119	71	1
139	591	407	283	530	240	239 A	78	81	186	101	93	3
650	738	294	252	290	573 B	217	80	68	180	61	40	37
409	138	656	295	164	270	206	298	75	188	66	610	29
653	654	40	253	159	468	701	269	90	220	479	190	2
831	378	632	310	492	Ap. 1-11	751	205	188	118	474	494	12
830	379	168	305 A	503 B	247	752	217	196	226	483	493	8
604	343	304 A	373	294	555	721	202	199	105	221	617	64
672	305	597	286	459	560	499	189	217	106	117	572	93
409	383	492	401	243	160	498	182	180	107	140	192	31
661	386	327	434	320	321	239 A	536	181	108	644	84	44
674	392	304	411	280	258	269	153	34	55	172	97	473
167	304	237	432	461	326	241	543	226	51	178	93 A	672
599	447	539	264	230	267	631	284	586	200	551	92	38
902	413	370	214 A	323	265	503 A	269	100	145	196	65	47
516	390	363	313	322	277	262	726	224	133	113	458 B	45
688	316	299	689	718	228	324	723	630	141	131	45	41
374	554	311	549	26	284	179	266	367	700	85	43	46
736	212	244	575	27	218 D	191	547	185	539	94	99	48
594	210	316	647	701	345	749	538	120	228	18	72	58
402	740	315	422	568	356	661	544	101	496	129	60	98
650	346	314	743	248	257	728	56	121	366	130	124	82
668	414	314 A	568	329	269	729	204	79	480	30	103	618
685	309	247	346 A	285	28	721	193	82	126	100	136	20
425	232	689	340	276	57	60	198	66 A	127 A	642	510	64
590	548	419	448	269	169	206	272	54	178 A	729	641	218
737	581	418	357	273	218 A	458	110	145	478 A	633	151	5
627	687	401	433	238	238 A	194	127	188 A	272 F	614	150	68 A
739	682	293	449	361	238 B	198	52	187	472	95	621	35
663	692	715	451	293	245	333	77	332	488	86	613	10
673	580	724	208	325	246 A	225	63	69	573 A	88	611	201
671	425	716	56 A	719	454 A	183	545	481	645	112	758	7
666	359	717	119 A	218	573 C	221 A	541	161	127 A	111	229	9
596	660	747	171	492	526 C	219	263	732 A	732 A	478	83 A	14
694	659 A	411	233	461	572 A	567	261 A	479	145	145	89	4
371	518	459	163 B	319	Ap. 2-63	732 A	637	490	142	223	23	15
421	307 A	288	237 A	289	268	535	556	29 A	141	72 A	64 A	64 A
376	381	429	448 A	293	335	570	227	121 A	619	635 A	72 A	72 A
408	377	400	370 A	234	362	289 A	731	132 B	643	577	177	177
23	389	450	Ap. 2-13	246	435	499	282	135	644	475	Tammite	Tammite
175	372	452	429 A	546	443	334	471	180 A	644 A	577	577	577
805 A	307	448	442 B	691	460	331	16	181 A	620	635 A	635 A	635 A
830 F	306	231	600 A	684	502	730	81 A	225 A	92 A			
688 A	308	287	377 A	530	521	56	222	472	21			
405	341	254	656 A	369	526 B	Ap. 1-16	68 A	506	128			
515	495	218 E	Ap. 2-63	439	528	24	496 A	508	123			
662	391	542	652 A	249	531	76	595 A	509	624			
663	396	596	401 A	490 C	554	173	281		613			
667	447	524	415	165	559	284 A	365		336			
772	695	291	418 A	167	561	507 A	634		114			
778	564	449	420 E	595	574 A	587	Agnesite		89			
779	565	629	423 B	495	598	541 A	Bism.		62			
780	550 A	655	424	495 A	697	276 A			733			
781	Ap. 1-13	520	427	503	705	330			635			
781 A	554 C	166	431	573	Andr.	365			638			
781 B	420	520 A	437	271	Hypo	470			73			
781 C	375	371	454	250	Vall.	484			96			
782	163 A	370	456 A	235	Zono	598			122 A			
783	418	307 B	463	76	Pyro				152			
787	404	255	500	540					174			
793	465	297	504	153 A					624 A			
794	322 A	274	529	702					486			
798	741	310 B	550	572					619			
799	214	446	554 B	622					636			
799 A	462	445	554 C	558								
800	231 A, B	445 A	562	569								
	520 C	440	575	456								

Cacoelastite (discovered by A. E. F. in 1880) was described by Prof. H. C. Lewis. We have good square prisms at from 15c. to \$2.00, some associated with blue calcite.

Astrophyllite, that interesting micaceous-looking mineral from Colorado, whose properties Dr. König has so fully investigated, in good specimens at from 5c. to \$1.50.

Among my specialties, not mentioned elsewhere, are the White Garnets from Canada; the red, from Alaska, Bergen Hill, and Franklin Minerals, etc., etc.

Feldspar Group.

I. RELATION OF THE SPECIES OF FELDSPAR.

The species of the Feldspar Group are related—
A. In crystallization: (1) the forms being all oblique; (2) the angle of the fundamental rhombic prism I , in each, nearly 120° ; (3) the other angles differing but little, although part of the species are monoclinic and part triclinic; and (4) there being two directions of easy cleavage, one, the most perfect, parallel to the basal plane O , and the other parallel to the shorter diagonal section, with the intervening angle either 90° (as in the monoclinic species orthoclase and hyalophane), or nearly 90° (as in the triclinic species).

B. In composition: (1) the only element in the sesquioxide state being aluminum, and those in the protoxide state either calcium, barium, sodium, or potassium, or two or three of these bases together; (2) the ratio of 1 atom of R to 1 of R_2 being constant; (3) the amount of silica in the species increasing with the proportion of alkali, being that of a unisilicate in the pure lime-feldspar, anorthite, that of a tersilicate in the soda-feldspar, albite, or potash-feldspar, orthoclase, and so directly proportioned to the alkali, that the amount in any lime-and-soda feldspar may be deduced by taking the lime (or calcium) as existing in the state of a unisilicate, and the soda in that of a tersilicate, and adding the two together. Anorthite has the formula $CaAl_2O_6Si_2$.

Albite " " $Na_2Al_2O_6Si_3$
 The constitution of a species containing Ca and Na_2 in the ratio of 1 to 1 for the protoxide portion may be obtained as follows: Adding together the anorthite and albite formulas, we have $CaNa_2Al_2O_6Si_5$; then dividing by 2, the formula becomes $\frac{1}{2}Ca\frac{1}{2}Na_2Al_2O_6Si_5$, which expresses the composition of andesite. With 3 parts of the Ca unisilicate, and 1 of the Na_2 tersilicate, the composition is that of labradorite. So it is for other combinations, that is for other species between anorthite and albite in composition.

The equivalent ratio for the R, Al, Si, in the several species of the group, is as follows: V means *triclinic* in crystallization, and IV *monoclinic*.

	System Ratio of Crystallization.		System Ratio of Crystallization.
Anorthite,	1:3:4	V, Oligoclase,	1:3:9
Labradorite,	1:3:6	V, Albite,	1:3:12
Hyalophane,	1:3:8	IV, Microcline,	1:3:12
Andesite,	1:3:8	V, Orthoclase,	1:3:12

These are the *normal* ratios; but there is some variation from them in the analyses, part of which is variation in actual composition, and part a result of interlamination or mixture of two feldspars together. Thus, orthoclase occurs mixed with microcline, albite, or oligoclase. But while such mixtures account for the soda found in some analyses of orthoclase, it does not for that in all, since soda does occur in many specimens of pure orthoclase, replacing part of the potash. It is the same with the triclinic feldspar microcline, which has the composition of orthoclase, and may have the alkali portion all potash or part soda, one analysis of typical microcline giving only 0.8 of soda. It is, hence, not safe to calculate the percentage of orthoclase present in a feldspar from the percentage of potash. Moreover, potash is present in much albite.

The above ratios show that anorthite has for the ratio between R+R and Si, 4:4, or 1:1, as in true unisilicates; while in albite and orthoclase, the same ratio is 4:12 or 1:3, that of a tersilicate, as above stated.

C. Physical characters: the hardness being between 6 and 7; the specific gravity, between 2.44 and 2.75; lustre vitreous, but often pearly on the face of perfect cleavage; and each species transparent to subtranslucent.

II. ACIDIC AND BASIC FELDSPARS.

Oligoclase, albite, and orthoclase are called *acidic* feldspars, because of the large amount of the acidic element, silicon, in their constitution, analyses giving 60 to 70 per cent. of silica; and labradorite and anorthite are called *basic* feldspars, the amount of silica being 42 to 55 per cent. Correspondingly, eruptive, and metamorphic rocks in which either of the acidic feldspars is a prominent constituent—for example, granite, gneiss, trachyte, true porphyry—are called *acidic* rocks; while those rocks in which basic feldspars are constituents—like dolerite, and a large part of eruptive rocks—are called *basic* rocks.

III. DISTINCTIONS OF THE TRICLINIC FELDSPARS.

The triclinic feldspars are distinguished from the monoclinic (*e. g.* orthoclase) by the occurrence of very fine striations on the cleavage surface, sometimes too fine to be seen without a good pocket-lens. These striations are due to multiple twinning parallel to the other cleavage face. They are rarely absent from triclinic feldspar crystals. There are best brought out by transmitted polarized light, in which a transverse section of the crystal is seen banded with spectrum colors, each band corresponding to one plate of the twin structure.

The triclinic feldspars, andesite excepted, may be distinguished from one another by an optical method when the cleavage direction can be made out. For this purpose a plate is prepared parallel to the plane of easiest cleavage. In such a plate the multiple twinning is parallel to the other cleavage plane, or the shorter diagonal. When the plate is placed on the stage of a polariscope, between crossed Nicol prisms, as the stage is revolved, the adjoining bands of color become dark alternately, and the angle through which the plate has to be revolved for the change between consecutive bands varies for different species, it being 54° to 74° for anorthite, 10° to 14° for labradorite, 4° to 8° for oligoclase, $6\frac{1}{2}^\circ$ to 8° for albite, and 30° for microcline. The shorter diagonal of the crystal bisects this angle, so that the angle made with this diagonal is 27° to 37° for anorthite, 5° to 7° for labradorite, 2° to 4° for oligoclase, $3\frac{1}{2}^\circ$ to 4° for albite, and 15° for microcline. Obtaining cleavage plates for such measurements in the case of slices for microscope investigation, is seldom possible, and when not so, the only certain resource for the distinguishing of triclinic feldspars is chemical analysis. These feldspars have been called *plagioclase* (from the Greek words for *oblique* and *fracture*), as if all were of one species. The term is a convenient cover for ignorance.

IV. DISTINCTIONS FROM OTHER MINERALS.

When in crystals, the form is sufficient to determine a feldspar, so also the fact of two unequal cleavages inclined to one another at 84° to 90° , one of them quite perfect. No fibrous, columnar, or micaceous varieties are known. They differ from rhodonite, by the absence of a manganese reaction; from spodumene, by the absence of a lithia reaction as well as cleavage angles; from scapolite, by form, the cleavage angles, the more difficult fusibility; from nephelite, by form, and also in difficult fusibility, and not gelatinizing with acids, except in the case of anorthite and labradorite, which fuse with but little more difficulty than nephelite, and often will gelatinize.

ANORTHITE.—INDIANITE. LIME FELDSPAR.

Triclinic. Angle between the two cleavage planes 85° and $94^\circ 10'$. Crystals tabular. Also massive granular or coarse lamellar. Color white, grayish, or reddish.

Composition. $CaAl_2O_6Si_2$ =Silica 43.1, alumina 36.8, lime 20.1=100. B. B. fuses with much difficulty to a colorless glass; decomposed by hydrochloric acid, the solution gelatinizes on evaporation.

Obs. Occurs in basic eruptive rocks; also in some metamorphic rocks. Found in the lava of Vesuvius; in the Tyrol; Faroe Islands, Iceland; in imbedded crystals in some dolerite of the Connecticut Valley.

At Hanover, N. H., anorthite crystals occur altered to a silicate which afforded, in an analysis by Hawes, only 2.2 of lime, and, in place of the rest of this ingredient, 7.11 of potash, 3.77 of soda, 1.10 of iron-sesquioxide, and 2.67 of water, with 30.05 of alumina and 52.52 of silica; which compound, if the water be made basic, has the ratio nearly of labradorite, though distinct from that species in the alkalies, and also in specific gravity, which is 2.96 or very nearly 3. It has some relation to zoisite, and to typical saussurite, but is widely different in constituents and ratio; it is related also to jadeite.

LABRADORITE.—LIME-SODA FELDSPAR. LABRADOR FELDSPAR.

Triclinic. Angle between the cleavage planes $93^\circ 20'$ and $86^\circ 40'$. Usually in cleavable massive forms.

Color dark gray, brown, or greenish brown; also white or colorless. Often a series of bright chatoyant colors from internal reflections, especially blue and green, with more or less of yellow, red, and pearl-gray.

Composition. $\frac{1}{2}Ca\frac{1}{2}Na_2Al_2O_6Si_3$ =Silica 52.9, alumina 30.3, lime 12.3, soda 4.5=100. Sometimes contains a little potash in the place of the soda. B. B. fuses quite easily to a colorless glass. Only partially decomposed by hydrochloric acid.

Obs. A constituent of the larger part of eruptive rocks, as dolerite, and amphibolite, and many lavas; and also of some metamorphic rocks. Occurs as an ingredient in part of the Archaean rocks in North America, and was named from its first discovery in Labrador. (5c. to \$3.00 per specimen. A. E. F.)

Andesite. Triclinic. Angle between the cleavage planes 87° – 88° . Near labradorite in composition. The formula $\frac{1}{2}\text{Ca}_2\text{Na}_2\text{AlO}_{12}\text{Si}_4$ = Silica 59.8, alumina 25.5, lime 7.0, soda 7.7 = 100.0.

Hyalophane. Monoclinic, and hence angle between the cleavage planes 90° . A baryta feldspar; the formula like that of andesite, excepting the substitution of Ba for Ca and K_2 for Na_2 . It has been found in the Binneithal, Switzerland, and at Jakobsberg, Sweden.

A baryta-feldspar, having the ratio of andesite, 1:3:8, has been described which is *triclinic*, and approaches oligoclase in optical characters.

OLIGOCLASE.—SODA-LIME FELDSPAR.

Triclinic. Angle between the cleavage planes 93° $50'$ and 86° $10'$. Commonly in cleavable masses. Also massive.

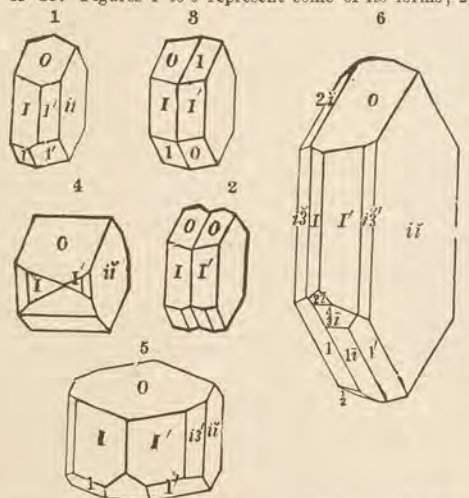
Color usually white, grayish white, grayish green, greenish, reddish. Transparent, subtranslucent. H.=6.7. G.=2.5–2.7.

Composition. $\frac{1}{2}\text{Ca}_2\text{Na}_2\text{Al O}_{14}\text{Si}_5$ = Silica 61.9, alumina 24.1, lime 5.2, soda 8.8 = 100. A portion of the soda is usually replaced by potash. B.B. fuses without difficulty; not decomposed by acids.

Obs. It occurs in granite, syenite, and various metamorphic rocks, especially those containing much silica; and in such case usually associated with orthoclase. *Sunstone* is in part oligoclase containing disseminated scales of hematite giving bright reflection from the interior of the stone. Occurs in Norway. *Moonstone* is in part a whitish opalescent variety. Oligoclase occurs at Unionville, Pa.; Haddam, Conn.; Mineral Hill, Del.; Chester, Mass., etc. (5c. to 1.50 each.)

ALBITE.

Triclinic. Angle between the cleavage planes 93° $36'$, 88° $24'$. Figures 1 to 6 represent some of its forms; 2



and 3 are twin crystals. The crystals are usually more or less thick and tabular. Also massive, with a granular or lamellar structure. Color white; occasionally light tints of bluish white, grayish, reddish and greenish. Transparent to subtranslucent.

Composition. $\text{Na}_2\text{Al O}_{16}\text{Si}_6$ = Silica 68.6, alumina 19.6, soda 11.8 = 100.0. B.B. fuses to a colorless or white glass, imparting an intense yellow to the flame. Not acted upon by acids.

Clevelandite is a lamellar variety occurring in wedge-shaped masses at the Chesterfield albite vein Mass.

Obs. Albite occurs in some granites and gneiss, and is most abundant in granite veins. Fine crystals occur at Pike's Peak, Middletown and Haddam, Conn.; at Goshen, Mass., and Granville, N. Y.; Unionville, Delaware Co., Pa.

The name albite is from the Latin *albus*, white. (5c. to 5.00 each. A. E. F.)

MICROCLINE.

A triclinic potash feldspar. The name microcline was originally given by Breithaupt to a whitish or reddish feldspar from the zircon-syenite of Fredericksværn and Brevig, Norway, on the ground that it was triclinic. It was shown by Descloizeaux that this feldspar was merely a variety of orthoclase, remarkable for its large amount of soda. Recently the latter author has proposed to retain this name for a feldspar found in the midst of granites, pegmatite and gneiss, which is shown both by the angle between its cleavage planes, and also by its optical properties, to be really triclinic. Form generally like that of orthoclase. Cleavage basal and clinodagonal, and also easy parallel to both prismatic faces (I and I'). Often associated with orthoclase in regular parallel bands, especially in the amazonstone; albite is also sometimes present, though irregularly. Analysis of a "pure microcline" from Magnet Cove, by Pisani (to whom I furnished the specimens. A. E. F.) G.=2.54.

$\text{SiO}_2\text{ Al}_2\text{O}_3\text{ Fe}_2\text{O}_3\text{ K}_2\text{O Na}_2\text{O}$ ign.

64.30 19.70 0.74 15.60 0.48 0.35 = 101.17

It is very close to orthoclase in angles, and also in physical characters, and identical with it in composition. But it is very slightly triclinic, the angle between its cleavage planes varying from $16'$ from 90° ; and hence its cleavage surface shows usually the fine striations exhibited, with rare exceptions, by all the triclinic feldspars. Colors white, flesh-red, copper-green. The last is what has been called amazonstone; as heat destroys its color it has been supposed to be of organic origin. (Organic salt of iron, König.) (5c. to \$50.00 for crystals.)

The association of orthoclase and microcline was observed in specimens from the Ilmen Mts., Urals; Arundal; Greenland; Labrador; Everett, Mass.; Delaware, Chester Co., Penn.; Pike's Peak, Col.; Redding, Ct., etc. "The purest microcline was that of a greenish color from Magnet Cove, Ark.; it enclosed crystals of *egirite*, and was not mixed with orthoclase. Des Cloizeaux." The microcline from Magnet Cove, which Des Cloizeaux calls the purest, I can furnish at from 25c. to 5.00, according to size and color. That from Redding, Ct., 5c. to 1.00.

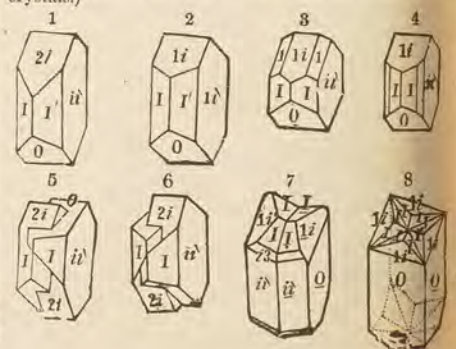
ORTHOCLASE.—COMMON FELDSPAR.

Monoclinic; and hence angle between the cleavage planes 90° . Figures 1 to 4 represent common forms, and 5 to 8 twin crystals. Usually in thick prisms, often rectangular, and also in modified tables. Also massive, with a granular structure, or coarse lamellar; also fine-grained almost flint-like in compactness. Colors light; white, gray and flesh-red common; also greenish and bluish-white and green.

Composition. $\text{K}_2\text{Al O}_{16}\text{Si}_6$ = Silica 64.7, alumina 18.4, potash 16.9 = 100. Soda sometimes replaces a portion of the potash. B.B. fuses with difficulty; not acted on by acids.

Common feldspar includes the common subtranslucent varieties; *Adularia*, the white or colorless subtransparent specimens, a name derived from Adula, one of the highest peaks of St. Gothard. *Sandite* or *glassy feldspar* includes transparent vitreous crystals, found in trachytes and lavas; but some of the "glassy feldspar" belongs to the species *amorphite*. *Loroclase* is a grayish variety with a pearly or greasy lustre that contains much soda.

(I am indebted to John Wiley & Son, for these cuts of crystals.)



A. E. FOOTE'S CATALOGUE OF MINERALS.

MOONSTONE is an opalescent variety of adularia, having, when polished, peculiar pearly reflections. *Sunstone* is similar, but contains minute scales of mica. Aventurine feldspar often owes its iridescence to minute crystals of specular or titanite iron, or limonite. Sunstone and Moonstone are mostly oligoclase, and so is a large part of aventurine feldspar.

DIFF.—Distinguished from the other feldspar by the right angled cleavage, and the absence of striated surfaces.

Obs.—Orthoclase is one of the constituents of granite, syenite, gneiss, and other related rocks, also of Porphyry and Trachyte, and it often occurs in these rocks in imbedded crystals.

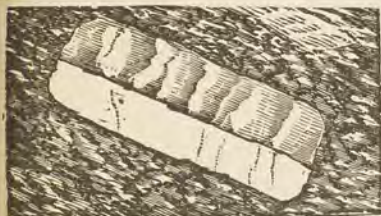


Fig. 57. Porphyritic Gneiss 5 cents to 50 cents.



Fig. 58. Oriental Verd Antique, 50 cents to \$1.00

FELSITE is compact, uncleavable orthoclase, having the texture of jasper or flint, which it much resembles. It often contains some disseminated silica. It occurs of various colors, as white, gray, brown, red, brownish red and black, and is sometimes banded. It is distinguished from flint or jasper by its fusibility. Felsite is the material of beds or strata in some rock formations, and also of dykes or masses of eruptive rocks. The vicinity of Marblehead, Mass., is one of its localities. It is the base of much Red Porphyry, of Egyptian Porphyry or Rosso Antico. 50c. to \$1.00.

Fine specimens of Sphaerulitic Felsite, 5 cts. to 25 cents.

As I have sold over \$7,000 worth of Amazon stone in the last 8 years, I am certain that my customers will all be interested in the following items in addition to what is given on the preceeding page.

Amazon Stone, Microcline.

The locality is 40 miles from any village, 7 miles from any travelled road, and for this distance the road has been built through high peaks of the Rocky Mountains in order to bring the Amazon stone out. No ores have been found in connection with it, although the country has been burrowed by practical miners for the last 20 years. The rock in which the Amazon stone is found is a very porous, graphic granite, containing no veins of any sort, and Amazon stone is found entirely in surface pockets, all of which have run out at a depth of 8 or 10 feet. The deposit extends over a limited area beyond which the most energetic prospecting has failed to reveal much more than a few traces of color. And as I am a practical collector of 20 years experience in the Eastern, Western, Northern and Southern States, I feel that I can confidently say that the locality is virtually exhausted. I am selling crystallized Amazon stone for about one-hundredth the price that it was ever sold, before 1875 when this locality was discovered. I visited the locality before any, except surface specimens, had been removed, and

have since that time made six trips to it. So I have nine-tenths of all the specimens now offered for sale in stock. I still furnish good crystals at from 50 cents to \$50.00; slabs and pieces 5 cents to 50 cts. Many of these are sold for less than the cost of cleaning and freight.

The following account of the coloring matter is given by Dr. König, in the Proc. Acad. Nat. Sci. of Phila. for 1876.

"DR. GEORGE A. KÖNIG spoke about the coloring matter of the Amazon stone from Pike's Peak. This beautiful mineral has lately been obtained in large specimens and in considerable quantity through the exertions of Dr. Foote, who furnished the author with the material for this investigation. The color of the Amazon stone from Pike's Peak varies between a light



bluish-green and a dark emerald-green. On many specimens the faces of modification, as prisms and domes, are without color, yellowish, or flesh-colored. The interior of very large crystals is likewise of a much lighter color generally than the outside.

Assuming the coloring principle to be a compound of iron, the following experiments were made to test the value of this hypothesis:—

1. Fragments were exposed to the action of boiling hydrochloric acid and aqua regia for several days, until the liquid was free from iron. Under this treatment the intensity of color was increased, the coloring substance withstands, therefore, the action of the above agents.

2. Fragments, prepared by the treatment described, were placed in a glass tube, and hydrogen passed through the latter at a red heat. After cooling, the mineral was found possessed of an evenly spread gray color.

3. The same pieces were now treated with oxygen at a red heat, and exhibited, after cooling, an even rose color, the intensity of which was proportional to the intensity of the green.

4. Green fragments were heated in an atmosphere of dry chlorine at increasing temperatures. No change occurred until at a red heat, when the mineral became perfectly white, and a slight sublimation of ferric chloride was noticed.

5. The rose-colored pieces become white when boiled in strong hydrochloric acid.

6. Thin fragments do not show at any place a concentration of the green color, when examined under the microscope.

7. Heated in the outer flame of a Bunsen burner, the same effect is caused as in the current of oxygen, but with a less brilliant color.

These experiments prove—

First. That the basis of the coloring substance is iron. Second. That the iron is present as a very stable compound, probably as an organic salt.

Third. That the coloring substance is not in molecular combination with the feldspar; because, if it were so, the iron could not be extracted completely by hydrochloric acid from a solid piece after oxidation; but that the color is of later date, and caused by infiltration into the numberless capillary cleavage fissures of the mineral.

Investigation into the composition of the organic acid is reserved for a future communication.

These have for many years past possessed the highest interest to mineralogists, partly on account of their rarity, partly on account of the obscurity of the reactions of Titanium, [it is not many years since it was first recognized] but mainly on account of the very remarkable trimorphism that is illustrated by Titanic acid under the names of Brookite, Rutile and Anatase, and more recently the remarkable Paramorphism [treated of by Vom Rath on next page,] of Rutile after Brookite, and the discovery of a new form of Brookite.

The influence that the mere collecting of minerals has upon the progress of Mineralogy and Chemistry is shown by the following statistics, taken from Prof E. J. Hallock's Index to the Literature of Titanium. See No. 13358 in Chemistry book list. The discovery of the Magnet Cove locality by a collector gave rise to seven papers on Titanium in 1849, which was more than three times as many as there were in 1848. In 1874 I visited the Magnet Cove locality, and the number of papers in '75 was twice as great as in '74. The mineralogical papers of 1876 were four times as great as in '74, and the papers of '77 were far more



Quite full details of the various Titanium minerals given in the table of species. The geniculated ["gentle a knee"] rosettes of Rutile from Magnet Cove are the finest in the world.

Rutilus signifies shining red, and my rutile from Georgia and Pa. is so, but that from Ark. is the black variety called Nigrin. The various forms of Titanic acid are used by dentists in manufacturing porcelain. As I have sold over \$1,000 worth of titanium minerals in the last five years, I am certain my customers will be interested in the following:

Proc. Acad. Nat. Sci., Phila., May 9, 1876.

Hydrotitanite.—A New Mineral.

Dr. George A. König.

The crystals of perovskite, pure octahedrons, or octohedrons modified by the cube, are often found to have yellowish-gray spots much softer than the rest of the minerals, and, in some instances, the whole crystal is composed of the same yellowish-gray substance. The specific gravity of one of these crystals was found to be 3.681; nearly 0.2 less than the fresh mineral. An analysis of the same made with 0.5 gramme, gave the following:

TiO ₂	=	82.82
Fe ₂ O ₃	=	7.76
MgO	=	2.72
CaO	=	0.80
H ₂ O	=	5.50
Vd	=	Undet
		99.60

herewith proposed if the analysis of more specimens should prove the constancy of the composition [as it has, 1880. A. E. F.]

Dr. König also called the attention of the Academy to the occurrence of opaque nuclei observable in microscopic slides of garnets, in which, by analysis, 6 per cent. of Titanic Acid was found. He had obtained recently, through the kindness of Dr. Foote, a fragment of a garnet crystal, weighing about three ounces, on which the faces of the dodecahedron are visible, and concentrically a nucleus, contrasting by its bright pitchy lustre, with the dirty circumferential part of the crystal. The line of contact is apparently very well defined, but on producing on it a fresh fracture, no difference in color and lustre, and no line of division can be seen. The streak of the centre is reddish gray, that of the circumference light greenish gray. Starting with the hypothesis of a gradual change from inside towards the outside, or, vice versa, a cut was made through the crystal, about parallel with one of the principal planes of symmetry, and thus a slice was obtained half an inch thick; this was divided radically into three sections, and one of these was cut into five parts at equal distances from the centre.



numerous than those of '75 or '76. Such is the record, and yet how often some pseudo-scientist says of a gentleman of taste and means who has satisfied his love for the beautiful with works of absolute perfection instead of copies on canvas, "Oh! he is a mere collector!" True scientific men appreciate the value of such collections, and even if poor manage to have them at their command. I am selling Brookite, rosettes of Rutile, Perovskites, &c., at less than half the price they were sold at before I visited the locality in 1878. Good Brookite crystals, perfect on every side, 15c. to 5.00. Specimens on the gangue, 25c. to 5.00. Rutile and Brookite, nearly pure, 25c. alb. Specimens of Schorlomite, 15c. to 3.00. Menaccanite crystals, 5c. to 2.00. Perovskite crystals 1" c. to 5.00. Hydrotitanite crystals 25c. to 5.00. Rosettes and Masses of Rutile, 15c. to 5.00.

Rutile in Quartz
Fleche d'Amour,
Arrows of Love,
or Venus Hair
Stones are the
names applied to
the charming
specimens containing long needles of Rutile penetrating Quartz. Specimens from 25c. to 5.00. Anatase, 50c. to 5.00. Titanite or sphene, 10c. to 3.00.



PARAMORPHOSIS OF RUTILE AFTER ARKANSITE.

BY PROF. GERHARDT VOM RATH.
(Poggendorff's Ann. CLVIII, 1876.)

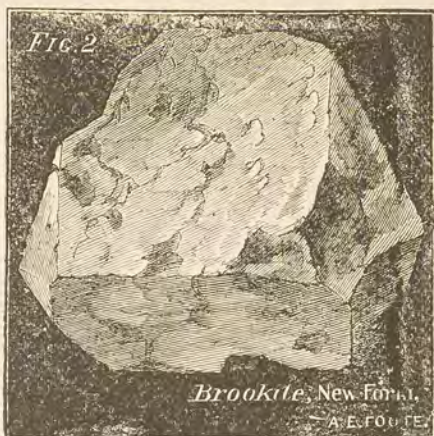
TRANSLATED FOR THE BULLETIN BY PROF. G. A. KOENIG, PH. D.



Some crystals of arkansite from Magnet Cove, which I obtained some time ago through Mr. B. Hürtz, are in many respects very remarkable, and different from those usually obtained at the above locality. They present generally the seemingly dihexahedric form, resulting from an evenly-balanced combination of the prisms with the pyramid, but also forms in which the prism M is largely predominating, as in the accompanying figure. They are further distinguished by a brown color and a curious lustre resembling very much that called "moiré metallique" by the French. The faces do not reflect in their corresponding plane, at least not over their entire extent. They show, on the contrary, a spotted appearance of alternating lustrous and dull patches in one position, and at another position a reversion of lustre and dullness on the same spots. As several parts of neighboring faces reflect simultaneously it is demonstrated that the reflecting elements on different faces are in corresponding position. This phenomenon is similar to the one noticed in some iron meteorites after etching. The satin-like lustre, moiré, or false life is always the result of the formation of new, more or less parallel crystallographic elements in the primary substance. On closer examination, the surface of these arkansites or brookites resolves itself into innumerable small crystals of rutile, whilst at the same time the interior is not any more black arkansite, but a dark reddish brown rutile. A clear case of paramorphosis of rutile after brookite is thus made out, strengthened by the change in specific gravity. I made several determinations with good-sized crystals and found,

Spec. Gr. 4.148—4.212.

agreeing closely with that of rutile (4.18—4.25). Often the rutile crystals are so small that neither their form nor their position can be ascertained with either naked eye or magnifying lens. But they may be recognized by the variation of lustre, which is silky on the prismatic faces and vitreous on those of the pyramid. Most usually, however, the rutile crystals are large enough to allow an identification of their form ($P_{\infty} P_{\infty} P_{\infty} P_{\infty} P_{\infty} P_{\infty} P_{\infty} P_{\infty}$) and also their relative position. On one of the specimens before me, in an aggregation of numerous pseudohexahedric arkansites) the rutile prisms are as long as 5 millimeters, and have evidently attracted the attention of a former observer, as the American label reads: "arkansite with an habit of rutile." However, there is not only a covering of the crystals with rutile, but a thorough physical change through their entire mass. From what has been said above, it follows that the rutile crystals possess a parallel position by groups, and not only towards each other, but likewise towards the arkansite, whose form they imitate. There is a tendency of the small crystals to arrange themselves parallel to certain planes of the mother crystal. This is not a twinning in the more restricted sense, but merely a kind of similarity in the direction of certain axes or edges. The directing force upon the epigones of rutile is unmistakable. The position upon the arkansite (dwindling in its essence) exercised upon the rutile prisms on the faces M is mostly vertical in a manner that a face of the prisms of the second order would



coincide with the macropinakoid of the arkansite. The position is only approximately parallel, and often interrupting. In another position the small crystals are placed across the brachy diagonal edge of the pyramid. It is curious how the moiré design assumes irregularly rounded shapes (resembling the lustreless twin-spots in quartz), and again, patches bounded by straight lines, which pass from one face to the other with the same position of the splendid elements.

Thus we have, then, presented to us a new and notable example of the fact that two dimorphous modifications of one and the same substance occur in the physical appearance of one body, the one having left the outlines of its crystallographic form as a memento of its existence, whilst the second dimorphous modification is manifest in the smaller crystals of subsequent formation. This paramorphosis is analogous to one known heretofore and described by Dr. Blum, (III, Nachtrag zur Pseudom. des Mineralentus, p. 264) that is the transformation of octahedrite (anatase) into rutiles.



The new form that Prof. Vom Rath describes was noticed by me soon after I first visited Magnet Cove, and the figures that illustrate it were engraved about one year ago. The material upon which he made his exceedingly interesting observations passed through my hands. The brookite shown in fig. 7 was obtained by me nearly two years ago, and the actual size is shown. I have specimens of this rare form at from 25c. to \$5.00 each.

I desire again to call attention to the exceedingly low rate at which I sell Rutile and Brookite, 25c. each, free from gangue. *Shadow or Phantom crystals* from Hot Springs, some of which are very beautiful, I can furnish at from 25c. to \$2.00.

4. On *Zonochlorite*, a New Hydrous Silicate from Neepigon Bay, North Shore of Lake Superior, Canada.

BY A. E. FOOTE.

IN 1867, during a natural history excursion through that portion of British America that borders upon the north shore of Lake Superior, I examined some minerals in possession of one of the traders of the Hudson Bay Company.

Most of these were varieties of quartz, but among them was what he called a green agate. I succeeded in obtaining a very small piece from him. This I examined in the Winter of 1867 and 1868, and pretty fully satisfied myself that it was something new. The specimen that I had was too small to admit of quantitative tests, and I therefore postponed making public my discovery. In the summer of 1868 I organized an exploring party of thirteen men, having for my main object the discovery of the locality of this mineral. In this I fully succeeded.

It occurs in the amygdaloid trap on the shore of a small island which lies off the mouth of Neepigon Bay; the largest bay on the north shore of Lake Superior.

It is associated with laumontite, stillbite, prehnite, quartz in the varieties amethyst, agate, carnelian, copper, datholite, and calcite. The mineral is found massive, banded with different shades of dark green. It has a hardness of $6\frac{1}{4}$ to $7\frac{1}{4}$, and is quite tough. Its specific gravity is 3.113, on the average of 16; highest 3.157, lowest 3.042.

(The following analysis by Mr. Hawes, Instructor in the Sheffield Scientific School of Yale College, differs but very slightly from mine, mainly in that I got nearly 8 per cent. of ferric oxide. Owing to the embarrassing circumstances under which I made my analysis, I have more confidence in his results than in my own.

Silica,	35.94.
Alumina,	19.41.
Ferric Oxide,	6.80.
Ferrous Oxide,	4.54.
Lime,	22.77.
Magnesia,	2.48.
Soda Trace, Water,	8.40.
Total,	100.34.)



Heated in a test tube, its powder yields water, and becomes brownish-white. The thin edges fuse with difficulty to a dark glass.

With borax and the fluxes it gives reactions of iron. In HCl it dissolves, with the separation of silicic acid, as a fine powder. The water was determined by igniting the powdered mineral in a glass tube ten inches long, closed at one end, and a quarter of an inch in calibre.

The water was condensed in the tube, and was removed by evaporation. It was found that less than one-tenth per cent. was lost by volatilization.

The average of a number of estimations gave as the percentage of water 8.7; the highest, 12.9; the lowest, 7.03.

The lime, silica, iron, and alumina were estimated by the ordinary methods detailed in Fresenius. The physical characters of the mineral seem to me to be so marked as to be sufficient to indicate a new mineral; and this also is the opinion of Professors Gustav Rose and Des Cloiseaux, as well as of many others to whom I have shown it.

On account of its hardness and toughness it is susceptible of a high polish, and may be used as a gem. I propose the name "*Zonochlorite*," from *zona*, a band, *chloros*, green, and *lithos*, stone.

Paper Trays with linen bound corners per hundred, 6x4 inches, \$1.00; 4x3 inches, 75 cents; 2x6 inches, 75 cents; 2x3 inches, 65 cents.

Embolite, Silver Chlorobromide.

In December of 1875 I took two old and experienced prospectors and Collectors down into New Mexico, and after much exploration, leased a silver mine some miles from Silver City, from which we took out the best embolite specimens ever offered for sale in this country. I have good illustrative specimens from 25 cents upwards, according to the coin value. I sell good characteristic specimens at from 25 cents to \$2.50 each, and I believe that no bromine mineral has ever been offered at such low rates. \$6.00 per lb. I have also crystalized cerargyrite from the same locality.

GRAPHITE in distinct hexagonal prisms from northern New Mexico. Pieces of any size from 10 cents to \$5.00 in value.

TITANITE OR SPHENE.

The latter name, and the one most commonly in use, is derived from the Greek word for wedge referring to the form of the crystals (Fig. 1 & 2). The name, Titanit, given by Delametherie in 1787, was given four years before Wm. McGregor found the red metal in the Cornish slags. Thompson gives the credit to Dr. Wollaston, but McGregor's discovery was published in *Croll's Ann.* 1, 40, 103. It is almost the eldest of the titanium group, for it was only four years earlier that De Lisle discovered Rutile, or red tourmaline, as he called it, and it was ten years later before Nigrine, (long considered scarce, but which I have obtained in large quantities at Magnet Cove, Ark.,) the other variety of Rutile was discovered. About the same time Klaproth analyzed Titanite, making the first accurate analyses of a titanium mineral.

Cleveland, our American Nestor, (following Daubenton, 1799) calls Titanite, Silico-calcareous Oxide of Titanium, which well expresses its composition, the formula being, according to Brush, $(Ca O + Ti O_2) Si O_2$.

Its crystallization is monoclinic, the most common forms being those illustrated in this article, and modifications of them (Fig. 3 and 4). Twins are usually much more wedge shaped than the simple crystals see Fig. 3. The twinning plane is $i-i$, but the enormous twin crystals which I obtained in Renfrew Co., Canada, nearly all have the faces $4 i 8$ very much prolonged so as to make them take up nine-tenths of the surface of the crystal.

Cleavage, Dana says: *I* sometimes nearly perfect; $i-i$ and much less so, rarely 2 easy, -2 less so." The cleavage of the Titanite from Renfrew is so very remarkable that almost without exception our best mineralogists all mistook its brilliancy for that of a crystal surface. Specimens from this locality show cleavages in the direction of 2 , and sometimes in the direction of $i-i$, so brilliant that they might be mistaken for crystals like Fig. 1, instead of being "rarely lamellar," nearly all found at the Renfrew locality, even when in masses of several hundred pounds, is very strongly so, the lamellae sometimes being very strikingly waved and contorted.

The Renfrew Titanite is clove brown, and this is the common color.

The Lederite (Fig. 3), which I obtained at Natural Bridge, Lewis Co., N. Y., is this color, as also is the semelene, grains of titanite, looking, in color and shape almost exactly like flaxseed, and scattered through white quartz and scapolite at the same locality.

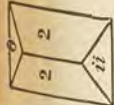


Fig. 1



Fig. 2



Fig. 3

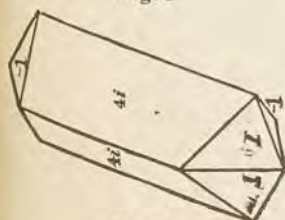


Fig. 4

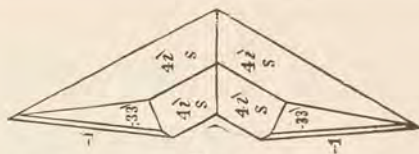


Fig. 5

In 1876, Dr. Forwood presented to the Academy of Natural Sciences, of Philadelphia, very beautiful and translucent yellowish-green crystals of sphene from Delaware Co., Pa. They are also found black, yellow, and gray.

The manganesian or Greenovite variety is red or rose colored, lustre resinous, very bright. The streak is white, sometimes reddish. Transparent—Opaque Fracture imperfectly conchoidal, uneven, brittle. Before the blowpipe some varieties change color, becoming yellow and fusing with intumescence, at or below 3 , to a blackish glass. A clear, yellowish-green glass, with borax. The partial solutions with HCl give a violet reaction when boiled with tin, owing to the separation of titanate acid. Titanite is one of our most widely distributed minerals. Besides the localities already mentioned, very beautiful green crystals are found in the Alps and at very many places in the U. S., but none of the old localities will compare with the newly discovered ones in Renfrew Co., Canada. Good crystals from Renfrew, 15c. to \$25.00. Fine Cleavages, 5c. to \$2.50; Lederite crystals, 15c. to \$3.50; Semelite, 10c. to \$1.50; Massive Titanite, 25c. a pound, pure. Mixed with rock, 10c. a pound. See catalogue for prices of other titanium minerals.

White Garnet.

SHEFFIELD SCIENTIFIC SCHOOL OF YALE COLLEGE, NEW HAVEN, CONN. July 17th, 1881.

DEAR SIR.—The garnet from Hull which you sent me last spring I succeeded in pickingsufficiently pure for analysis, and Mr. Marcus D. Munn, of the Sheffield Laboratory, under Prof. O. D. Allen, found it to be a lime alumina garnet, very near in composition to the white garnet from Oxford, Canada, analyzed by Dr. T. S. Hunt, and the white one from the Urals, analyzed by Croft. (See Dana 5th ed. p. 267, analysis 1 & 3.) It contained but about 1 per cent. of iron. Mr. Munn's analysis gave:

Silica.....	39.85
Alumina.....	22.07
Ferric-oxide.....	1.13
Lime.....	36.31
Magnesia.....	0.63

100.04

Respectfully yours,
GEO. J. BRUSH.

Dr. A. E. Foote.
Crystals 5c to \$5.00.

"THE Bergen Hill Tunnel is famous for the abundance, beauty, and variety of the Minerals which it brought to light. Datolite, Pectolite, Calcite, Analcite, Apophyllite, Natrolite, Stilbite, and others were obtained there during its excavation, in a degree of perfection rarely equalled by the productions of any other locality."

[Dr. E. S. Dana, in the *American Journal of Science and Art*, Vol. IV., July, 1872.]

In the excavation of the new tunnel of the Delaware, Lackawanna, and Western Railway, west of Hoboken, which is now approaching completion, an opportunity has been afforded to mineralogists for obtaining some rare minerals. They were first brought to light in this locality some years ago, when the Erie tunnel was made, and specimens were sold by collectors at large prices. The Palisade Ridge is a volcanic formation called a trapdike. It is in the seams and cavities of this rock and deep below the surface that these crystallizations are sparingly found, some of which are very beautiful.—*N. Y. Commercial Advertiser*.

All Bergen minerals mentioned above and others, at from 5c to \$5.00 each.

[Am. J. Sciences, March, 1878.]
CRYSTALLIZATION OF VARISCITE.

PROF. ALBERT H. CHESTER.

A Microscopic examination of certain small crystals of the mineral variscite, from Arkansas, reveals the following facts with reference to its method of occurrence and crystallization.

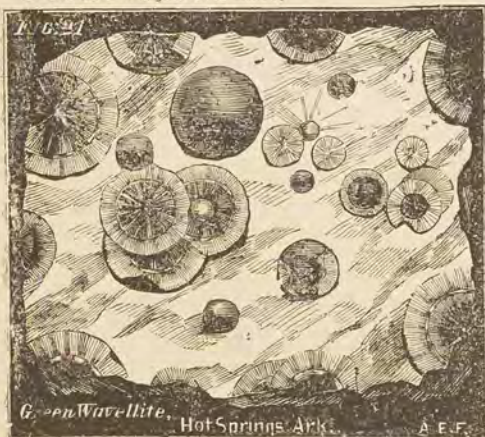


Fig. 2.

A striking peculiarity of this mineral is its high lustre, like that of beryl, which it much resembles when viewed under a low power. The crystal figured above is 0.3 mm. in diameter, and is about the average size of those examined. — Hamilton College Laboratory, January 19, 1878.

I have good specimens of this beautiful mineral which was so rare that, although it was described and named in 1837, enough of it was never obtained at the European locality for analysis. I sent Prof. Chester the material for the first analysis ever made.

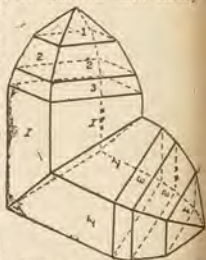
The crystals are rarely distinct, but are usually found in complicated groups, sometimes forming clusters of a sheaf form. Very rarely single prismatic crystals are found, sufficiently distinct to admit of measurement. Figure 1 gives the most common form, belonging to the orthorhombic system, and showing faces of I, u, u and O. In this crystal I A I = $214^{\circ} 6'$. In general, but one termination is seen, but crystals showing both ends are sometimes found on the quartz matrix, the bases being similar to each other. The face u is very small and therefore easily overlooked, and u is about the same size as I, so that these crystals may readily be mistaken for hexagonal prisms. Crystals showing a simple termination like that in Fig. 2 are seldom seen. More frequently the basal plane is like fig. 2, or still more complicated. These planes are often covered with a thin opaque white coating, probably of quartz.



His careful analyses, republished from the Am. Jour. by us, proved that though originally called Peganite, it is the Variscite of Breithaupt and the Callinite of Damour. It occurs at the same locality as the green Wavellite. As a rule the two are not associated, and the Variscite is a much lighter, brighter green than the Wavellite. The latter almost invariably shows radiating surfaces. More rarely globular masses are found. I can furnish large showy specimens at from 50c. to \$5.00. Small, good specimens at from 10 to 50 cents. I have just broken up a large mass of green Wavellite that I had exhibited at the American Exposition in London. In it were cavities lined with balls of terminated crystals that I can sell at from 50c. to \$5.00. Surfaces showing radiations, 5 to 50 cents.

Twinned Crystals of Zircon.

As will be seen from the annexed quotations from the Proceedings of the Mineralogical Section of the Academy of Natural Sciences of Philadelphia, I was the first to put on record the discovery of twinned crystals of Zircon at an American locality. I have not heretofore thought it necessary to give a history of this matter in the LEISURE HOUR and should not do so now were it not for the fact that others have claimed credit for putting the discovery on record and even for the original observation. In this connection it is interesting to notice that in spending a pleasant half day in looking over Prof. Brush's exceedingly valuable private collection he called my attention to a minute but clear twin of Zircon from that remarkable locality, Branchville, Ct. We are indebted to Mr. W. E. Hidden for the following figure which was engraved by him for the American Journal of Science and Arts, in which it was published June, 1881, and is there marked "communicated March, 18th." As will be observed we communicated the fact of the twins of Zircon at the first meeting, Sept. 27th, 1880, of the Mineralogical Section of the Academy of Natural Sciences, which was held after the summer intermission, which commenced with July, 1880.



My trip to Canada in 1880, was designed especially to collect large crystals of tabular spar, sphene and Zircon, and in this I was very successful. The only twin crystals of Zircon which we saw during July were in the hands of a Phosphate Miner, and I mentioned the fact to members of the American Association at the meeting in Boston in August, and was invited to give an account of the Canadian locality before one of the Sections, but as the time was already well filled, I did not do so. I had distributed fragments of the Zircon crystals among the miners in Renfrew, and around Ottawa and Perth, and the result was that before January I had received twinned Zircons from Renfrew over an inch and a half in length.

Proceedings of the Mineralogical Section of the Academy of Natural Sciences, page 16, September 27th, 1880.

"A new locality for sphene.—Dr. A. E. Foote, described the new locality for sphene, and associated minerals at Eganville, Renfrew Co., Canada. The sphene occurs in immense crystals, weighing from 20 to 80 lbs., in a vein of apatite 20 feet wide. Many other veins of smaller size occur in the same county. The rock is principally Laurentian gneiss and granite. A solid mass of sphene, very highly cleavable, (5x2x2), was observed in the side of the vein. It yielded several hundred pounds of sphene. Close by it doubly-terminated crystals of scapolite, weighing over 50 lbs., and crystals of pyroxene, weighing from 12 to 30 lbs., were found. Phlogopite and Zircons, some of them twinned, occur at the same locality. From the enormous size of all the crystals found in this county, it must rank as one of the most remarkable mineral localities known. When the vein, 20 feet wide, spoken of above, was discovered, a doubly-terminated crystal of apatite, weighing 300 lbs., and bright upon the surface and ends, was said to have been found.

January 24, 1881.

On Twin Crystals of Zircon.—Dr. A. E. Foote, recorded the discovery of perfect twin crystals of Zircon, near Eganville, Renfrew Co., Canada. He had obtained small but imperfect twin crystals over four months before, but not sufficiently distinct to establish the character of the twinning at the time. As in cassiterite and rutile, the twinning plane is 1-1. It is doubtful if twins of Zircon have ever been seen before."

We have still an abundance of sphene, apatite, pyroxene, zircon, scapolite, and all the other Canadian minerals we have so often advertised before, of any size, degree of perfection, or beauty, at prices ranging from 5c. to 25.00.

QUARTZ, SI.

Name probably derived from the German, signifying the grating sound made by clay in kneading it. Hexagonal. In slender six-sided prisms attached by one end and terminated by a six-sided pyramid. Sometimes short and doubly terminated. Prism faces commonly striated. Modification given below most common. Usually stated that it is not cleavable, but I have specimens from Arkansas that show very distinct cleavage parallel with both pyramidal and prism planes. Massive granular, stalactitic and concretionary forms. Colorless if pure; often shades of yellow, red, brown, green, blue, violet, black. Lustre vitreous, sometimes nearly resinous; splendent-dull, transparent-opaque. Streak white if pure, but if colored same color but paler. Fracture conchoidal with very sharp edges. Tough, brittle or friable. H. 7. G. 2.5-2.8. Infus. Insol.



Crystalline or Vitreous forms. 1. Rock Crystal. Colorless, usually transparent. This is the most widely distributed of all minerals, and owing to its great beauty the first usually collected. It is found in all parts of the world, but Arkansas, Brazil and Switzerland give us the finest crystals. They are sometimes of great size. From Arkansas I have obtained crystals nearly a foot in diameter, and I have now one group in the Permanent Exhibition that is about 4 feet by 3 in superficial area. It is far finer than anything exhibited last year from Brazil or Russia. The crystals are as clear as water. The larger crystals are usually opaque. A group in the University of Naples weighs nearly $\frac{1}{2}$ a ton. A crystal at Milan is $\frac{3}{4}$ feet in length, $\frac{5}{8}$ feet in circumference, and weighs 870 pounds. About a century ago one cavity at Zinken produced crystals that sold for \$300,000. From Herkimer Co., N. Y., are obtained remarkably clear doubly terminated crystals containing liquid and other impurities. Along the Upper Mississippi are found round masses of quartz which when broken open show cavities lined with beautiful crystals. A group which I exhibit at the Permanent Exhibition is nearly 2 feet in diameter. The waters of the wonderful geysers of the Yellowstone National Park contain silica in solution, and have formed some very fine mammillary and stalactitic shapes upon a base of translucent Chalcedony. I purchased about 5,000 pounds from the Specimen Mt., and have one mass weighing over 300 pounds on exhibition at the Permanent Exposition. Groups of crystals are highly valued in China and Japan as ornaments for the apartments of the rich, and bring enormous prices.

It is very much employed for spectacle glasses, being far superior to glass, as it is not liable to lose its high polish. It is also used in optical instruments. When used for such purposes it is commonly known under the name of Brazilian Pebble. It is also much used for ornamental purposes. In India the natives hollow it out in cups, globes, and vases. They believe it to be the mother or external husk of the diamond, and call the crystal the ampe and the diamond the ripe diamond. The Chinese do not cut it as well as the natives of India. The Japanese cut it into large round balls used for cooling the hands, for like all true stones it feels much cooler than glass or paste. The Greeks supposed it to be water congealed by intense cold, as the name (*κρύσταλλος*, ice) signifies, and believed it could only be found in the far north. In the middle ages it was believed to be incapable of containing poisons, and that it would betray their presence by breaking or becoming obscured, consequently cups and goblets made from it were highly esteemed, being frequently covered with the most beautiful ornamentation. The Emperor Nero is said to have possessed two magnificent crystal cups, engraved with subjects from the Illiad, which cost an enormous sum. When his downfall took place he destroyed them that no one else might drink from them.

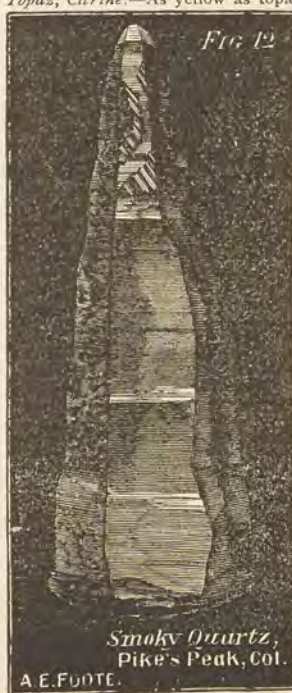
The large round balls, under proper manipulation, were supposed to possess magical powers, and to disclose events which were to happen, and show persons who were distant. The famous crystal globe of Dr. Dee is an illustration of this belief. Crystal was used in powder, mixed with wine, and given in cases of dysentery. Pieces also were held against the tongue in fevers to assuage thirst. For this latter purpose it is still considered useful.

The green, pink and other colored quartz beads sold at summer resorts are formed by heating the crystal to redness and then throwing it in various colored solutions. The sudden cooling causes the crystal to crack all through and the liquid penetrates the fissures. Owing to their minuteness the crystal seems to be uniformly colored. In 1797 the quartz crystal treasures of the crown of France were valued at over \$500,000 of our money.

Arkansas crystals, 5cts. to \$150.00; Herkimer Co., N. Y., doubly terminated, from 10cts. to \$5.00.

Geodes from Upper Mississippi, 10cts. to \$5.00; Yellowstone National Park specimens, based on chalcedony, 10cts. to \$15.00.

2. *Asteriated Quartz* contains within the crystal radiations. 3. *Amethyst*—The clear purple or bluish violet color is supposed to be due to Manganese. Name from the Greek, *αμβρο*, "not to intoxicate." Pliny mentions the belief that the name arose from its approaching the color of wine but not quite attaining it. It was very highly esteemed during the middle ages as a gem, being supposed to dispel sleep, sharpen the intellect, and be an antidote against poison. It is now very much esteemed on account of its beautiful color and brilliancy. It also has the merit of appearing remarkably well with mourning. Set with pearls and as little gold as possible, it appears to the best advantage. Diamonds appear well with the deepest colors. Various violet colored stones, like sapphires, fluor, &c., were called amethysts by the ancients. The finest specimens come from Thunder Bay, Lake Superior, Yellowstone National Park, Brazil, India and Persia. In the Permanent Exhibition I exhibit an amethyst geode which was evidently originally the trunk of a tree. It is of a beautiful color and is surrounded by agate; from Yellowstone National Park. It is in two pieces. One about 15 inches in diameter and two feet long, worth \$50.00, and one about one foot thick and 20 inches long, worth \$20.00. I have many smaller specimens on a beautiful chalcedony base at from \$1.00 to \$5.00 each. From Thunder Bay I have remarkably fine specimens varying in size from an ounce to 150 lbs., and in price from 5c. to \$50.00. Many of these are exhibited at the Permanent Exhibition. 4. *Rose*—Rose-red or pink, fades on exposure or heat, massive, sometimes opalescent and usually much cracked. Colored by titan acid or manganese. Used as a gem. When of good color and cut it is sometimes sold for pink spinel, but the hardness easily distinguishes it. 5. *Yellow, False Topaz, Citrine*—As yellow as topaz, but, unlike it, has



no cleavage. It is also distinguished by its superior hardness. A very large portion of the gems called topaz are only citrine. 6. *Smoky, Cairngorm, False Topaz*—Smoky yellow to smoky brown, and sometimes transparent. Brownish black crystals are usually opaque. The color, which is easily destroyed by heat, is supposed to be due to organic matter. This stone is very well suited for a mourning stone on account of its color. It is very much used, especially by the Scotch, who gave it the name cairngorm (grief at the grave.) The finest specimens are found at Pike's Peak Colorado, and Switzerland. I have at the Permanent Exhibition a smoky quartz crystal over four feet long and one foot in diameter. It is worth \$75. Other specimens of every size and price, from 5c. upward. Crystals can be ordered at the rate of 10c. per inch.

QUARTZ, CHALCEDONIC VARIETIES

7. *Milky*.—Nearly opaque; sometimes with greasy lustre, and then called *greasy quartz*. Occurs in mountain masses, called improperly *white flint*, and used for glass making.

8. *Catseye*.—Fibres of asbestos penetrating the quartz give it a beautiful opalescence, but no prismatic colors. It can also be distinguished from the chrysoberyl by its inferior hardness and specific gravity. Used as a gem. Colors yellowish, greenish, greyish or red. 9. *Aventurine* is spangled with scales of mica, &c. Used as a gem, but the artificial is much more beautiful. 10. *Impure from the presence of other minerals*. Ferruginous either red or yellow, Chloritic, actinolitic, bituminous, arenaceous enclosing clay, micaceous, &c. 11. *Saginitic*. Containing acicular crystals of other minerals. Those containing rutile are called by the French *Fleches d'Amour* or *Venus' hair stone*, Cupid's net or *Love's meshes*. I have very handsome specimens of this from North Carolina and Switzerland. The finest one I have ever known is one from N. H., that I purchased in the Chilton collection from Tiffany & Co. The same names have incorrectly been applied to quartz, containing hornblende, epidote, actinolite, tourmaline, goethite, asbestos, &c. 12. *Containing liquid in cavities*. By changing the position the liquid is seen to move if the cavity contains air. The liquid is either water (with or without soluble substances) CO_2 or petroleum-like substances. Very good specimens are found at Herkimer County, N. Y., and Hot Springs, Ark.

CRYPTOCRYSTALLINE VARIETIES. 1. *Chalcedony* is quartz with a little opal through it. White to black, grayish, pinkish, bluish. Waxy lustre, translucent, sometimes transparent. Much tougher than quartz and with a more even fracture. Found lining geodes. I exhibit very beautiful specimens from the Yellowstone National Park, Fox River, Illinois and Iceland. Much used as a gem, especially for engraving. Various forms of it are used for chemical apparatus, as mortars, pestles, &c., also for burnishers, handles of various kinds, &c. Stalactitic and mammillary forms are common. A curious hacked form from Yellowstone National Park.

2. *Carnelian* is clear red chalcedony grading into grayish red. Sometimes supposed that the color is due to organic matter, but it is owing to the presence of iron, Heintz having found, by analysis, that Carnelian contains a small quantity of it. Thus:

Peroxide of iron.....	0.050
Alumina.....	0.081
Magnesia.....	0.028
Potash.....	0.0043
Soda.....	0.075

The best specimens are of a perfectly uniform color, free from undulations and the muddiness to which European specimens are liable.

Carnelian is susceptible of a high polish, and, for that reason, and the brightness of its color, it has always been a favorite substance, much used for seals, brooches, rings, necklaces, &c., both in ancient and modern times.

"Generally, all Rubies be verie hard for to be cut, and this ill qualitie they have, That they never doe seale cleane, but ordinarily plucke some of the wax away with the signet: contrariwise, the Cornalline or Sarda, signeth verie faire without any of the wax sticking to it."

"In old time, there was not a precious stone in request, than the Cornalline: and in truth, Menander and Philemon have named this stone in their Comædies, for a brave and proud gem: neither can we find a pretious stone that maintaineth the lustre longer than it, against any humour wherein it is drenched; and yet oile is more contrarie unto it than any other liquor. To conclude, those that be of the colour of honey are rejected for nought; howbeit, if they be worse than those."—Pliny, book xxxviii. chap. 7.

Forbes states that Carnelians, Agates and the beautifully variegated stones improperly called Mocha stones, form a valuable part of the trade of Cambay, to which place the art of cutting and polishing these stones seems to be exclusively confined. "The best Agates and Carnelians," he adds, "are found in peculiar strata, thirty feet under the surface of the earth, in a small tract among the Rajpipla hills, on the banks of the Nerubudda; they are not to be met with in any other part of Luzerat; and are generally cut and polished in Cambay. On being taken from their native bed, they are exposed to the heat of the sun for two years; the longer they remain in that situation the brighter and deeper will be the color of the stone; fire is sometimes substituted for the solar ray, but with less effect, as the stones frequently crack and seldom acquire a brilliant lustre. After having undergone this process, they are boiled for two days and sent to the manufacturers at Cambay. The Agates are black, white and red, in shades from the pale yellow to the deepest scarlet."—Oriental Mens., vol. ii.

p. 20.

From the circumstance that the lustre of the stones becomes inferior when artificial heat has been substituted for that of the solar rays, it may be inferred that the change of color is not produced by the sun's heat alone, but that light, or the actinic ray, exercises considerable influence in producing the effect described. It may here be observed that the chalk-flints, which form the superficial gravel in many parts of this country, are very frequently of a bright red and yellowish-brown color, in fact, converted into Agates and imperfect Carnelians by long exposure to the sun's heat and light, and the consequent peroxidation of the iron contained in them. Polished specimens, 15 cents to \$1.50.

3. *Chrysoprase*, name from χρυσός gold, and πρασιν a leek. Apple-green Chalcedony colored by nickel. In Europe it is highly valued as a gem, and is made into brooches, rings, bracelets, seals, snuff-boxes, cane heads, &c. The apple-green variety is the most valuable. It should be cut *en cabochon*, as it is spoiled if cut in facets, and it appears to most advantage by candle-light. Chrysoprase is apt to lose its color and to become dark and clouded if kept in a dry, warm situation, or if it be long exposed to the light of the sun; but the color may be restored by keeping the stone in a damp place, or in wet cotton or sponge, or even by dipping it into a solution of nitrate of nickel, which also improves the tints of inferior kinds.

The kings of Prussia used only to allow the works where it is found to be opened once in three years, and they monopolized most of the finest specimens; consequently, semi-transparent stones of a delicate color, fit for setting in rings, formerly fetched very high prices in Berlin and Vienna. The common people of Silesia wear Chrysoprase round the neck as a charm against pains.

It is found at Kosemutz, in Lower Silesia, imbedded in Serpentine, and associated with Opal, Quartz and Chalcedony. I obtained a quantity from a gentleman who brought it from Silesia. 25 cents to \$2.00 per specimen.

5. *Prase*, πρασιν a leek. Translucent and dull leek green. Same name applied to Crystalline quartz of same color. Sometimes cut, but of little value.

6. *Plasma*. Name from πλάσμα an image. Bright green to emerald green. Subtranslucent. Sometimes dotted with white.

Heliotrope or *Bloodstone* is essentially the same with spots of red Jasper looking like drops of blood. Used for seals, rings and many other ornaments on account of its beautiful color and great hardness. In the middle ages, the red spots were supposed to be the blood of Christ. The name heliotrope (from ἥλιος, the sun and τροπή, to turn), was given it because when immersed in a vessel of water, it was said to make the image of the sun to appear in it of the color of blood. "Out of the water the sun is seen in it as in a mirror, the eclipses of the sun become visible, and the moon is beheld to pass under the great star." Polished specimens, 10 to 75 cents.

Heliotrope or bloodstone is found near South Park, Col., Arabia, Siberia, &c. In the National Museum at Paris may be seen a head of Christ flagellated, cut in Heliotrope, the drops of blood being represented by the natural red spots of the stone. The ancients attributed to the Bloodstone a great many virtues, among others that of stopping hemorrhage, and of rendering the person who wore it invincible. The name heliotrope is applied to a flower, into which Ovid, in one of his metamorphoses, says that Apollo converted Clytia while she was, in despair, gazing at the sun.

7. *Agate* (Ἀγάτης). A variegated chalcedony. The colors are (a) banded; (b) clouded; (c) due to visible impurities; (d) Agatized wood.

(a.) Banded. They consist of delicately parallel layers of white, tendon-like, wax-like, pale and dark brown, and black colors, sometimes bluish and other shades. They are always found in the amygdulæ of igneous rocks as traps, lavas, &c., and their shape depends upon the shape of the original cavity. Thus arise the varied and sometimes grotesque convolutions assumed by the successive layers that make the Agate. If the outline of the cavity was sharp and irregular, then the agate would have many salient angles, such as may be seen in the plan of a fortification. These are the *Fortification Agates*. If the cavity was long and uniform in outline, if it was entirely filled by successive layers, these will, if cut, show a multitude of circular layers bearing more or less resemblance to the pupil of the eye. These are called *Eye Agates*. I have two very perfect ones that I bought with the Chilton collection. I value them at \$5.00 and \$10.00. If the same cylinder of silica is cut lengthways it shows a series of parallel lines forming what may be called *Ribbon Agate*. Thus art as well as nature may vary the character of Agates. They are quite porous and the colors of polished Agates are

QUARTZ CONTINUED.—VARIEGATION DUE TO VISIBLE IMPURITIES.

Improved by boiling in oil and sulphuric acid. Sulphate of Iron is also used.

A. MOSS AGATE is an exceedingly beautiful green or brown variety, showing an appearance exactly like moss through the stone. It seems possible that some, at least, of these, may be true fossils, just as well as the perfect hickory nuts showing meats, and every part perfect that I have collected, in the places where they had been petrified by the siliceous waters of volcanic regions. Phillips says:

"Dr. McCulloch has instituted a very ingenious inquiry into the nature of those vegetable appearances of different colors visible in the more transparent Chalcedonies, which are termed Mocha, and more particularly in those which are less so, termed Agate. Close observation, added to chemical experiment, induce the conclusion, that many of these appearances are owing to the existence in the stone of aquatic Coniferæ; that these plants sometimes appear, perfectly in their natural form and color; in others they seem to be coated by oxide of iron, which occasionally hides the form of the plants, and discolors it. Mosses, and some varieties of Lichen, have been observed; and occasionally Chlorite, which sometimes is so disposed as to represent a vegetable. A chrysalis, probably of a moth (?) was observed in an onyx Agate, in a ring in the possession of Earl Powis." Specimens 5 cents to \$1.50 each polished.

B. MOCHA STONE is the name usually applied to the more translucent varieties of brown moss agate. It is often exactly the color of Mocha coffee, after browning. Specimens polished or unpolished, from 10 cts. to \$1.50.

C. DENDRITIC AGATE shows only black arborescent forms through the Chalcedonic base. These markings are probably usually formed by the infiltration of water, containing a salt of manganese in solution, which afterwards changed to the black oxide, just as moss agates and mocha stones are due to the infiltration of some salt of iron. Specimens 15 cents to \$1.00.

D. AGATIZED WOOD, I have showing the grain well, and of almost every color. It forms beautiful ornaments when polished, and makes very handsome microscopic slides. When in the Rocky Mountain region I also collected hickory nuts that had been silicified, even to the meat cavities being filled with a clear chalcedony which resembled the meats of immature nuts. Good specimens 10 cents to 50 cents. Polished 25 cents to \$2.00. Slides for microscope, 35 cents each.

E. Brecciated Agate is simply agate which has been broken up and cemented together, by siliceous material. It is often as handsome as the most beautiful mosaic work. Good specimens polished, \$1.00 to \$2.50.

The name agate comes from Achatas, the name of a river in Sicily, where many agates were found in ancient times.

Agate was the eighth stone in the high priest's breast plate, and is noted as the type of firmness and consistency.

8. ONYX is simply agate, having the layers parallel or in nearly even planes. The onyx is usually of a blackish or brownish color, alternating with layers of white. It was the ninth stone in the high priest's breast plate. It derives its name from the Greek word *onyx*, meaning a finger nail. Onyx is found in Oberstein, L. S., Colorado, etc., etc. 5 cents to \$1.50 each.

9. NICCOLO or ONICOLA, is a brown and white onyx, having a deep brown ground overlaid by a layer of bluish white; the dark ground shows through. 10 cents to 50 cents each.

10. SARDONYX is like onyx in structure, but contains alternate layers of sard of carnelian, and white, black or brown chalcedony, 10 cents to \$1.00. 8, 9 and 10 are all very much used for the cutting cameos and intaglios, seals and signet rings. The darker shades are usually left to form the ground. Specimens 15 cents to \$5.00.

11. SARD, is the brownish red opaque variety of carnelian, usually appearing blood red by transmitted light. It was the first precious stone in the high priest's breast-plate, and was said by Marbodius to be good to be worn, and to make the person wearing it, beloved of men. It should have engraved on it a vine and ivy-twining around it. 10 cents to \$1.50.

12. AGATE-JASPER. An agate consisting of jasper, with veinings and cloudings of chalcedony. 25 cents to \$3.00.

13. SILICEOUS SINTER. Irregular cellular quartz formed by deposition from water containing silica or soluble silicates in solution. 25 cents to \$1.00.

14. FLINT. (Silex pt. Plin., Feuerstein Germ.) Somewhat allied to chalcedony, but more opaque, and of dull colors, usually gray, smoky brown, and brownish black. The exterior is often whitish, from mix-

ture with lime or chalk, in which it is imbedded. Lustre barely glistening, subvitreous. Breaks with a deeply conchoidal fracture, and a sharp cutting edge. The flint of the chalk formation consists largely of the remains of infusoria (Diatoms), sponges, and other marine productions. The silica of flint, according to Fuchs, is partly soluble silica. There is usually one per cent. or so of alumina and peroxyd of iron, with one or two of water. The coloring matter of the common kinds is mostly carbonaceous. Specimens 5 to 50c.

15. HORNSTONE. (Silex pt. Plin., Hornstein Germ.) Resembles flint, but more brittle, the fracture more splintery. Chert is a term often applied to hornstone, and to any impure flinty rock, including the jaspers. A grayish chalcedonic hornstone from Marienbad afforded Kersten Si 90.30, Al 3.10, Fe 1.73, Mg 128, Cu 094, Na and K 0.70, H 195. (Jahrb. Min., 1845, 656), 10 cents to 50 cents.

16. HONESTONE, or Novaculite, from Hot Springs, Ark., closely resembles the above, but is pure white and very closely grained. It is a metamorphosed sandstone. 5 cents to 50 cents.

17. BASANITE. Lydian stone or Touch stone. (Lapis Lydius Plin., xxxiii. 43, Basanites id. xxxvi. 11). A velvet-black siliceous stone or flinty jasper, used on account of its hardness and black color for trying the purity of the precious metals. The color left on the stone after rubbing the metal across it indicates to the experienced eye the amount of alloy. It is not splintery like hornstone. It passes into a compact, fissile, siliceous or flinty rock, of grayish and other colors, called siliceous slate, and also Phthanite; and then resembles ordinary jasper of grayish and other shades, especially the banded jasper. 10 cts. to 50 cts.

18. JASPER. Impure opaque colored quartz. (a) Red (Haematitis Plin., xxxvii. c. 60, not his Haematites), sesquioxyd of iron being the coloring matter. (b) Brownish, or ochre yellow, colored by hydrous sesquioxyd of iron, and becoming red when so heated as to drive off the water. (c) Dark Green and brownish-green. (d) Grayish Blue. (e) Blackish or brownish-black. (f) Striped or ribband jasper. (Bandjaspius Germ.), having the colors in broad stripes. (g) Egyptian jasper in nodules which are zoned in brown and yellowish colors.

19. PORCELAIN JASPER is nothing but baked clay, and differs from true jasper in being B. B. fusible on the edges. Red porphyry, or its base, resembles jasper, but is also fusible on the edges, being usually impure feldspar.

C. Besides the above there are also:

1. Granular Quartz, or Quartz Rock. A rock consisting of quartz grains very firmly compact; the grains often hardly distinct, 5 cents to 25 cents.

2. Quartzose Sandstone, 5 cents to 25 cents.

3. Quartz-Conglomerate. A rock made of pebbles of quartz with sand. The pebbles sometimes are jasper and chalcedony, and make a beautiful stone when polished, 5 cents to \$2.00.

4. Itacolumite or Flexible Sandstone. A friable sand-rock, consisting mainly of quartz sand, but containing a little talc or mica, and possessing a degree of flexibility when in thin laminae. It is extraordinarily interesting, especially in choice specimens, 10 cents to \$1.00.

5. Buhrstone. A cellular flinty rock, having the nature in part of coarse chalcedony, 25 cents to 50 cents.

6. Pseudomorphous Quartz. Quartz appears also under the forms of many of the mineral species, which it has taken through either the alteration or replacement of crystals of those species. The most common quartz pseudomorphs are those of calcite, barite, fluorite, and siderite. (a) Tabular Quartz consists of intersecting plates of quartz, and is probably a result of the quartz being deposited among intersecting plates of other minerals as barite or calcite. Good specimens 25 cents to \$1.50. (b) Haytorite of C. Tripe (Phil. Mag., 1. 40, 1827), is a pseudomorph after datolite. \$1.50. (c) Beckite Duf. is a pseudomorph after coral, chalcedonic in character, from Devonshire, England it contains some of the carbonate of lime of the original coral. (Church, Phil. Mag., IV xxxii. 95), 25 cents to \$1.50 each. (d) Babel-Quartz is quartz which has impressions of cubes of fluor, arising from its having been deposited over the crystals, 15 and 50 cents to \$1.00. (e) Silicified Shells are proper pseudomorphs in quartz; they occur through many rock strata, including limestone, 25 cents to \$1.50. (f) Silicified wood is quartz pseudomorph after wood. The texture of the original wood is usually well retained, it having been formed by the deposit of silica from its solution in the cells of the wood, and finally taking the place of the walls of the cells as the wood itself disappeared. Good specimens, 25 cents to \$1.50.

MINERALS BY THE POUND AND SPECIAL COLLECTIONS.

Mineral Fragments by the Pound for Blow-pipe and Technical Purposes.

Very few dealers advertise minerals by the lb., and these only a score or so. This is due to the irregular supply and the small stock that even most European dealers carry.

Large quantities of nearly all furnished at lower prices. 5 cents per lb. minerals are 10 c. per lb for quantities of less than 5 lbs.

10 cents is the lowest charge for any mineral by weight. The prices are only approximate, and vary from time to time.

Most of these are quite pure, and all are in the state they are found in nature.

Where they are not pure they are marked with an † or the % is given.

Actinolite,	5	Cryolite,	15
Agate,	25	Cuprite,	50
Alabaster,	10	Cyanite,	10
Albite,	5	Datolite,	50
Allanite,	25	Diatomaceous Earth,	15
Alum-stone,	50	Dimagnetite,	75
Alunite,	50	Dolomite,	5
Amazon Stone,	5	Dufrenite,	15
Amber,	1 25	†Dumortierite,	25
Amethyst,	25	Edenite,	10
Amphibole,	5	Elacolite,	25
Anhydrite,	10	Elaterite,	50
Anthraxite,	5	Electro Silicon,	50
Anthophyllite,	10	†Embolite,	6 00
Antimony,	30	Emerald,	10
“ Sulphide,	25	Enstatite,	5
Apatite,	5	†Epidote,	25
Arkansite,	25	Essonite,	15
Aragonite,	25	Feldspar,	5
Arsenic, native,	1 00	Fibrolite,	5
†Arsenopyrite,	25	Fibrous Gypsum,	5
Asbestos,	10	Flexible Sandstone,	5
Asphaltum,	15	Flint,	5
†Astrophyllite,	50	Fluorite,	5
Augite,	5	Fowlerite,	25
Azurite,	50	Franklinite,	10
Barite,	5	Gadolinite,	1 50
Baryocalcite,	25	Galena,	5
Beauxite,	5	“ Argentiferous,	10 to 50
Beryl,	15	Garnet,	5
Biotite,	25	†Genthiite,	25
†Bismuthinite,	50	Geode Quartz,	10
Bitumen,	15	Glaucanite,	5
“ Elastic,	50	Gothite,	35
Bituminous Coal,	5	Graphite,	15
Blende,	15	Guano,	5
Borax,	50	Gummitte, per oz.,	2 00
Bornite,	50	Gypsum, Fibrous,	5
Bourbonite,	1 50	Halite,	5
Brookite,	25	Heavy Spar,	5
Bronzite,	5	Hematite,	5
Cairngorm Stone,	5	Hornblende,	5
Calamine,	5	Honestone,	5
Calc Spar,	5	Hyd. Anthophyllite,	5
Cannel Coal,	5	Iceland Spar,	50 to 5 00
Cassiterite,	25	Idocrase,	10
Celestite,	15	Ilmenite,	5
†Cerargyrite,	2 00	Iolite,	10
Cerite,	1 25	Iron, Chromic,	15
Cerussite,	1 50	“ Magnetic,	10 to 50
Chalcocopyrite,	5	“ Pyrites,	5
Chalcedony,	5	“ Ores,	5
Chalcocite,	1 00	Jasper,	5
Chert,	5	Kaolin,	5
Chlorastrolite,	4 00	Labradorite,	5
Chloritoid,	10	†Lapis Lazuli,	50
Chondrodite,	25	Lava,	5
Chrysocolla,	15	†Lead Molybdate, 90%,	75
Chrysolite,	75	“ “ “ 50%,	25
Cinnabar,	5 to 15	“ “ “ 15%,	5
Clay,	50	“ “ Ore, Galena,	5
Coal, Bituminous,	5	†Leucite,	10
“ Anthracite,	5	Lepidolite,	15
Coccolite,	5	Limestone,	5
Colemanite,	35	Limonite,	5
Columbite,	10 to 50	LoDESTONE,	10 to 50
Copallite,	2 00	Magnetite,	10
Copiapite,	25	Magnetic Pyrites,	15
Copper,	1 00	Magnetite,	5
Coprolites,	35	Malachite,	25
Corundum,	5	† “ 40%,	10
Crocidolite,	1 00	Manganese, Carbonate,	50
“ Pseudomorph after,	10 to 25	“ Oxide,	5
		“ Silicate,	25
		Manganite,	50

Marble,	5	Samarskite,	1 00
Marcasite,	5	Scapolite,	5
Marl,	5	Schorlonite,	1 00
Martite,	10	Selenite,	10
Masonite,	15	Serpentine,	5
Melanite,	10	Siderite,	5
Menaccanite,	5	Silicified Wood,	10
Mercury, Sulphide,	50	Sillimanite (Var.),	5
Meteorite Iron,	4 00	*Silver in rock, from 50	
Mica,	5	“ to 90 per cent. silver, 7 50	
Microcline,	5	Smaltite,	2 50
Molybdate of Lead, see Lead		Soda Nitre,	15
Molybdate,		Specular Iron,	5
Molybdenite,	2 00	Sphalerite,	5
Monazite Sand, per oz.	25	Sphene,	20
Muscovite,	5	Spodumene,	20
Nephelite,	25	Steatite,	5
Nickel, Silicate,	25	Stibnite,	25
Nigrin,	25	Stilbite,	36
Novaculite,	5	Stream Tin,	25
Olivene,	15	Strontianite,	15
Oolite,	5	Strontia Sulphate	15
Opal,	10	Sulphur,	25
Orpiment,	1 00	Tabular Spar,	15
Orthoclase,	5	Talc,	5
Petalite,	50	†Telluride Ore,	3 00
Petrified Wood,	5	Tetrahedrite,	1 50
Petroleum,	15	Tinstone,	25
Phlogopite,	15	Titanite,	20
Pitch, Mineral,	15	Topaz,	20
Platinum, per oz.,	9 00	Tourmaline,	5
Plumbago,	15	Tremolite,	10
Prehnite,	35	†Triphyllite,	35
†Proustite, per oz.,	1 00	†Triplite,	50
Psilomelane,	5	Tufa, Calcareous,	5
Pyrite,	15	Turquoise,	1 00
Pyrites, Auriferous, 25 to 1 00		Ulexite,	1 00
“ Copper,	5	Uraninite,	3 00
“ Magnetic,	15	Vanadinite,	3 00 to 5 00
Pyrolusite,	15	†Variscite,	5
Pyromorphite,	1 00	Vermiculite,	5
Pyrope,	25	Vesuvianite,	10
Pyroxene,	5	Vivianite,	15
Pyrrhotite,	15	†Wavellite,	5
Quartz, clear,	10	Willemite,	20
“ Ferruginous,	5	Williamsite,	10
“ Milky,	5	Witherite,	10
“ Rose,	10	Wolframite,	50
“ Smoky,	5	Wollastonite,	15
Rhodo-chrosite,	50	Wulfenite, see Lead Mol.	
Rhodinite,	25	Zinc Blende,	5
Rock Crystal,	10	“ Silicate,	5
Rose Spar,	10	Zincite,	50
Rutile,	25	“ and Franklinite,	5
Satin Spar,	35	Zircon,	25

Special Collections.

Series illustrating the Metallurgy of any metal put up to order.

Ores and Metallic Minerals.

25 specimens, \$1.00. 50 specimens, \$5.00. 100 specimens, \$10.00.

Gold and Silver Minerals with Associations.

25 specimens, \$5.00. 50 specimens, \$15.00.

Iron Minerals and their Associations.

25 specimens, \$2.00. 50 specimens, \$7.50. 100 specimens, \$25.00.

Lead Minerals and their Associations.

15 specimens, \$2.50. 25 specimens, \$5.00. 50 specimens, \$20.00.

Copper Minerals and their Associations.

15 specimens, \$2.50. 25 specimens, \$5.00. 35 specimens, \$15.00.

Zinc Minerals, with Associations.

15 specimens, \$2.50. 25 specimens, \$7.50.

Minerals used in the Ornamental Arts.

(Sculpture, Painting, Porcelain, etc.) 15 specimens, \$2.50. 25 specimens, \$7.50. 50 specimens, \$25.00.

Minerals used in Agriculture.

25 specimens, \$2.50. 50 specimens, \$7.50. 100 specimens, \$25.00.

Minerals used for Chemical Manufactures.

25 specimens, \$1.00. 50 specimens, \$7.00. 100 specimens, \$25.00.

Minerals used in Manufacturing Medicines.

15 specimens, \$2.00. 25 specimens, \$5.00. 100 specimens, \$25.00.

Minerals used for Light and Heat.

15 specimens, \$2.00. 25 specimens, \$5.00. 50 specimens, \$15.00.

METALLURGY.

(For other books and papers, see references under Mineralogy, Mining, etc.)

- 71210 Adie R. Examination of Metals exposed to Thermo-Electric Action etc. 21pp. il. 8. unb. '43, 1, .25
- 1 Aikin. Portable Blast Furnace. pl. 8. unb. 1843, 1, .15
- 2 Althaus E. F. Mechanical Dressing of Ores and Coal. 132pp. 23 il. 8. unb. '78, 1, .60
- 3 Aluminum and Silicon Alloys produced by Cowles' Electric Furnace. 52pp. pl. il. p. 1, .25
- 4 Anfrye C. Separating Tin and Copper from Bell Metal. 8. unb. 1804, 1, .15
- 5 Arts and Sciences of the World, see No. 70060, 2.00
- 6 Balling C. A. M. Die Metallhuettenkunde. 637pp. 371 il. 8. 1885, G. new, 5.00
- 7 Becquerel M. Electro-Chimie appliquee aux Arts. 425pp. 3 pl. 44 fig. 8. hef. F. 1843, 1, .75
- 8 Berzelius. Analysis of Platina Ores. 8. unb. '29, 1, .10
- 9 Birkinbine J. Charcoal as Fuel for Metallurgical Processes. A. I. M. 1882, .15
- 71220 Blair A. A. Methods used in Analysis of Iron and Steel, Copper & Alloys. 20pp. 5 pl. il. 8. unb. '79, 1, .35
- 1 Blake W. P. Nickel; Production etc. 8. p. '85, 2, .10
- 2 " Notes on Metallurgy of Nickel in U. S. A. I. M. '83, 10
- 3 " T. A. Blake Syst. of Fine Crushing. il. A. I. M. '88, .15
- 4 Blanchard. Extracting Aluminium. 8. unb. '55, 1, .10
- 5 Bloxam. Metals, their Properties & Treatment, new, 1.60
- 6 Boebert K. F. Modurer Blaufarbenwerk in Norwegen. 86pp. map. 8. unb. 1847, G. 1, .50
- 7 Bowron. Metallurgy of Titaniferous Ores. A. I. M. '82, 10
- 8 Boyd C. R. Utilization of Iron and Copper Sulphides of Va., N. C. and Tenn. A. I. M. '85, .15
- 9 Bradley L. Tellurium, a Metal. A. A. S. '68, .10
- 71230 Brannet W. T. Metallic Alloys. 428pp. 16 il. '89, new, 2.00
- 1 Brunton. New System of Ore Sampling. il. A. I. M. '85, .15
- 2 Buccleugh. Condens. of Metallic Fumes. 8. unb. '55, 1, .10
- 3 Byrne O. Practical Metal Worker's Assistant. 683pp. 609 il. 8. 1880, 1, pub. at \$7.00, 3.50
- 4 Calvert & Johnson. Hardness of Metals, etc. 8. unb. '58, 1, .15
- 5 Campin A. Mechanical Engineering. Metallurgy. Casting, Moulding etc. 416pp. 29 pl. 100 il. 8. new, last ed., 4.00
- 6 Children J. G. On Cadmium. 8. unb. 1819, 1, .10
- 7 Christy S. B. Papers, A. I. M. Quicksilver Reduction at New Almaden. 38pp. 7 pl. 12 fig. '84, .25; Quicksilver Condensation at New Almaden. 60pp. il. '85, .25
- 8 Church. Notes of a Metallurgical Journey in Europe. il. 8. new, last ed., 1.60
- 9 Clark E. Ore Dressing and Smelting at Pribram, Bohemia. 42pp. map, 4 pl. 12 fig. A. I. M., .50
- 71240 Clarke F. W. Nickel Ores from Oregon. il. 8. s. t. '88, 1, .15
- 1 Cloud J. Papers, A. P. Trans. Experiments on Palladium. 1804, .15; Experiments on Crude Platinum. 1818, .15; Fusing Temperature of Metals. 1818, .15; Inquiry into the Nature of Metals. 1818, .15
- 2 Coste et Perdonnet. Memoires Metallurgiques. Atlas. 14 pl. 118 fig. 4to. hef. Paris 1830, F. 2, 1.50
- 3 Cumenge M. E. Employment of Steam in Certain Metallurgical Operations. 8. unb. 1854, 1, .20
- 4 Delaville. Oxidation of Metals. 8. unb. 1806, 1, .10
- 5 D'Hisinger & Berzelius. On Cerium. 8. unb. 1805, 1, .10
- 6 Dudley W. L. Iridium Industry. il. A. I. M. '84, .10
- 7 Dufrenoy. Beaumont, Coste et Perdonnet. Voyage Metallurgique en Angleterre. 2 vol. Text. 1356pp. 8. h. mor. F. '37, 1, and Atlas of 2 col. maps, 39 pl. 358 fig. oblong. h. mor. 1, rare and valuable, 10.00
- 8 Egleston T. Papers, A. I. M. Treatment of Mercury in N. Cal. 37pp. pl. '76, .25; Refractory Materials. 19pp. '77, .20; Thin Plates of Metals. '78, 10; Law of Fatigue & Refreshment of Metals. '79, 10; Appointment of U. S. Government Com. of Tests of Metals. 24pp. '82, 20; Method of Collecting Flue-Dust at Ems on the Lahn. 33pp. 3 pl. 19 fig. '83, 10; Machine for Testing the Phys. Properties of Metals and Alloys. 17pp. 2 pl. il. '83, 20; Accident to Steam Pipes from Use of Blast Furnace Wool. '83, 10; Basic Refractory Materials. 35pp. 17 il. '85, 20; Dunschack Continuous Regenerative Gas Kiln for Burning Firebrick etc. 16pp. 2 pl. 12 fig. '86, 15; Rolls for Crushing and Pulverizing Ores etc. 15pp. il. '86, 20; Mendheim Continuous Gas Furnace. 21pp. pl. 5 fig. '86, 20
- 9 Fontaine. Electrolysis. Nickeling, Coppering etc. Refining of Metals and Treatment of Ores by Means of Electricity. 34 il. 8. 1885, new, 2.80
- 71250 Forbes. Vibration of Heated Metals. 27pp. il. 8. unb. '34, 1, .25
- 1 Frazer P. Smelting Processes at Freiberg. 22pp. A. P. Trans. 1871, .15
- 2 Fourcroy & Vauquelin. On Platina. 8. unb. 1804, 1, .10
- 3 Fyfe A. Tutenag of China. 8. unb. 1822, 1, .15
- 4 Gore G. Electro-Metallurgy. il. new, last ed., 1.80
- 5 " Application of Science to Electro-plating. 18pp. pl. 3 fig. 8. unb. 1862, 1, .35
- 6 Graham. Brassfounder's Manual. 141pp. 25 il. '68, 2, .35
- 7 Greenwood W. H. Metallurgy of Copper, Lead, Zinc, Mercury, Silver, Gold etc. 375pp. 67 il. 1875, 1, .50
- 8 Gueniveau. Desulphuration of Metals. 16pp. 8. unb. '08, 1, .25
- 9 Guettier. Manufact. of Metallic Alloys. 293pp. '72, 2, 1.00
- 71260 Giulio C. I. Torsion des Fils Metalliques et l'Elasticite des Ressorts en Helices. 55pp. 4to. p. '47, F. 3, .30
- 1 Haüy. Electricity of Metal. Substances. 8. unb. '05, 1, .15
- 2 Henwood W. Manipulation of Ores. 8. unb. '57, 1, .20
- 3 Holley. Testing Machine at Watertown. A. I. M. '79, 15
- 4 Howe H. M. Patience of Copper and Silver as affected by Annealing. il. A. I. M. 1885, .15
- 5 Hume J. New Metal in Platina. 8. unb. 1804, 1, .15
- 6 Japing E. Elektrolyse, Galvanoplastik und Reinmetallgewinnung. 276pp. 46 il. p. G. '83, new, 1.10
- 7 Kent W. Papers, A. I. M. Apparatus for Testing Resistance of Metals to Repeated Shocks. il. '79, 15; Autographic Transmitting Dynamometer. il., .15
- 8 Kerl B. Metallurgy. ed. by Crookes & Roehrig. 8. new. Vol. 1. Lead, Silver, Zinc, Cadmium, Tin, etc. 10.00; Vol. 2. Copper & Iron. 8.00; Vol. 3. Steel, Fuel & Suppl. 8.00; or, the 3 vol., 26.00
- 9 Kirk. Founding of Metals. 272pp. il. new, 1. ed., 2.00
- 71270 Klaproth. Exam. of Antient Speculum. 8. unb. '04, 1, .10
- 1 Knight. Rendering Platina malleable. 8. unb. 1800, 1, .15
- 2 Koch F. Crystallizations formed during Metallurgical Operations. (Abstract). pl. 14 fig. 8. unb. '24, 1, .25
- 3 Krom S. R. Improvement in Ore Crushing Machinery. pl. 13 fig. A. I. M. 1885, .15
- 4 Kunhardt. Ore Dressing in Europe. il. 8. '84, new, 1.20
- 5 Lamborn. Metallurgy of Silver and Lead. 247pp. 75 il. 1861, 4, .50
- 6 Langdon. Langdon Gas Producer. il. A. I. M. '83, .10
- 7 Langer J. K. Beschreibung des Quecksilberwerkes Almaden. 95pp. pl. 17 fig. 8. unb. G. '79, 1, .50
- 8 Lardner D. Manufactures in Metal: Tin, Lead, Copper, Brass, Gold etc. 424pp. 96 il. 1834, 3, .50
- 9 Larkin J. Practical Brass and Iron Founder's Guide. 301pp. 5th and last ed. new, 1.60
- 71280 Lauder Sir T. D. Tutenag of China. 8. unb. '23, 1, .10
- 1 Levy & Kunkel. L'Emploi de Divers Alliages et specialement du Bronze Phosphoreux pour la Coulee des Bouches a Feu. 116pp. 42 pl. 4to. p. '71, 3, 1.00
- 2 " Same, trans. by Brandt. 123pp. 5 pl. il. 4to. '72, 1, .75
- 3 Lieber O. M. Desulphurization of Metalliferous Sulphurets, Holland's Process. 8. unb. 1854, 1, .15
- 4 Mackintosh J. B. Papers, A. I. M. '87. Crystalline Sulphide of Iron and Nickel. 10; Separation of Nickel and Cobalt from Iron. .10
- 5 Macfarlane. Slag Densities in Smelting. A. I. M. '79, 10
- 6 Makins. G. H. Manual of Metallurgy. 602pp. 100 il. 2d ed. London 1873, new, 2.00
- 7 Matthiessen. Chem. Nature of Alloys. pl. 8. unb. '63, 1, .30
- 8 Mayer. Metallurgy. il. new, last edition, .60
- 9 Meikle H. Electricity and Explosive Force of Steam and Economy of Hot-blast Furnace. 8. unb. '41, 1, .15
- 71290 Metallurgical Alloys. Earlier Researches on their Properties. Papers by Wertheim. Bibliogr. 83pp. 8. unb. '79, 1, .35
- 1 Mongez C. Bronze de l'Antients etc. 8. unb. 1801, 1, .10
- 2 Muspratt S. Chemistry as Applied to Arts and Manufactures. 2 vol. 2041pp. 31 port. 1108 il. 4to. 1, 8.00
- 3 Napier J. Antient Workers in Metal. 184pp. 1, .50
- 4 " Electro-Metallurgy. 164pp. 51 il. 2d Engl. ed. '52, 1, .35; or, same Am. ed. 856pp. 51 il. sh. '53, 2, .65; or last Am. ed. 150pp. il. new, 1.20
- 5 Neill J. W. Treatment of Nickel-Cobalt Mattes at Mine La Motte. A. I. M. 1885, .15
- 6 Nichols E. An Aluminium Ore. A. I. M. '87, .10
- 7 Official Cat. of Engineering and Metal Trades Exhibition, London 1883. 287pp. il. bds. 2, .25
- 8 Orschall J. Oeuvres Metallurgiques. La Fonderie, Liquefaction etc. 418pp. pl. 9 fig. cf. 1761, F. 2, 1.50
- 9 Outerbridge. Electric Spectra of Metals. 8 pl. A. P. '74, .25
- 71300 Overman F. Metallurgy. 720pp. 377 il. 8. '52, 2, 3.00
- 1 " Moulder's and Founder's Pocket Guide. 252pp. 42 il. '51, 1, .50; or, last ed. 342pp. 44 il. new, 1.60
- 2 Painter H. Metallurgy of Lead, Silver, Copper and Zinc. 253pp. 5 pl. 15 fig. 8. unb. 1876, 1, .35
- 3 Pearce R. Interesting Crystalline Alloys. A. I. M. '85, 10
- 4 Pepper. Play Book of Metals. 512pp. 265 il. 1, 2.00
- 5 Pepys et al. Analyses of Ores. 8. unb. 1804, 1, .20
- 6 Percy J. Metallurgy. Introduction, Refractory Materials & Fuel. 608pp. 9 pl. 111 il. 8. 1875, new, 9.60
- 7 Phillips J. A. Elements of Metallurgy. 849pp. 232 il. 8. 1887, new, 7.25
- 8 " Manual of Metallurgy. 639pp. 218 il. 1869, 2, 1.00
- 9 " R. Purification of Nickel etc. 8. 1803, 1, .10
- 71310 Pique E. Chemistry of Gold, Quicksilver & Lead. 133pp. 37 il. bds. San Francisco 1860, 1, 1.25
- 1 Poushkin. Rendering Platina malleable. 8. unb. '05, 1, .10

- 2 Proust L. Papers, 8. unb. 1. Experiments on Platina. 23pp. 1801, .25; Metallic Sulphurets. 1805, .20; Cobalt and Nickel. 1808, .15
- 3 Report of the U.S. Board appointed to Test Iron, Steel and other Metals (R. H. Thurston, Chairman). 2 vol. 1261pp. 430 pl. and diagrams, il. 8. 1881, 1, 2.00
- 4 Report of Officers of the Ordnance Bureau on Test of Metals. 235pp. 9 pl. many il. 8. stitched, 1881, 1, .25
- 5 Report on Experiments on Strength and other Properties of Metals for Canon. 428pp. 25 pl. 4to. '56, 2, 1.00
- 6 Report on Trial of Phosphorized Bronze as a Material for Guns. 25pp. 4 pl. folio, p. 1871, 5, .35
- 7 Richards. Aluminium, its Hist. Occurrence, Properties, Metallurgy etc. il. 1887, new, 2.00
- 8 Riano J.F. Industrial Arts in Spain. Iron Work, Gold & Silver Work, Bronzes etc. 284pp. 50 il. 79, 1, .60
- 9 Ridolfi's Method for pure Platinum. 8. unb. '47, 1, .10
- 71320 Rochon A. Observations on Platina. 8. unb. 1798, 1, .20
- 1 Röllmann W. Stellung der Legirungen in der thermoelektrischen Spannungsreihe. 8. unb. '52, 1, .25
- 2 Roscoe & Schorlemmer. Metals. 2 vol. 198 il. 8. '82, 1, 4.50
- 3 Roseleur A. Galvanoplastic Manipulations. 495pp. 127 il. 8. 1872, 1, 1.50
- 4 Scheerer T. Lehrbuch der Metallurgie. Vol. 1. Apparate, Brennstoffe etc. 634pp. 119 il. 8. 1848, G. 1, (The work was never entirely completed), .80
- 5 Scoffern. The Useful Metals and their Alloys. 8. London 1865, new, last ed., .260; or, hmo., 3.20
- 6 Shaw A. Manual of Electro-Metallurgy. 210pp. 2 pl. 21 il. 8. 1844, 2d ed., 2, 1.00
- 7 Smee A. Electro-Metallurgy. 191pp. pl. 7 fig. 8. '41, 2, orig. Engl. ed., 1.50; or, 2d Engl. ed. 368pp. 37 il. 8. hrm. '48, 2, 1.25; or, Am. ed. 395pp. 41 il. '52, 3, 1.00
- 8 Smith W. Dressing of Ores. 8. unb. 1857, 1, .15
- 9 Stevens Flux for Smelting Ores. 29pp. 8. p. '68, 1, .10
- 71330 Stoddard J.T. Outline of Lecture Notes on Chemistry: The Metals. 135pp. 1885, new, .80
- 1 Sturgeon W. Investigation of Magnetic Characters of Simple Metals, Alloys etc. 25pp. 8. unb. '47, 1, .25
- 2 Terhune. Sectional Slag & Matte Pot. il. A.I.M.'86, 10
- 3 Thenard C. Memoir on Nickel. 8. unb. 1805, 1, .10
- 4 Thomson W. Electro-dynamic Qualities of Metals. 103pp. 58 il. 4to. unb. 1856, 1, 2.00
- 5 Thurston R. H. The Alloys and their Constituents, il. 8. new, last edition, 2.40
- 6 " Report on Preliminary Investigation of Properties of Copper-Tin Alloys. 202pp. 84 pl. il. 8. unb. '79, 1, .75
- 7 Tilloch. Rendering Platina malleable. 8. unb. '05, 1, .15
- 8 Torelli. Three-blast Fusing Furnace. pl. 8. unb. '02, 1, .15
- 9 Trevelyan. Vibration of Heated Metals. il. 8. unb. '33, 1, .15
- 71340 Trowbridge & Stevens. Electromotive Force of Alloys. 8. unb. 1883, 1, .25
- 1 Uhlenhuth E. Darstellung des Aluminium, Kaliums, Magnesiums etc. 2 Parts. 110pp. 2 pl. 8. p. G. '59, 3, .50
- 2 Wahl W. H. Galvanoplastic Manipulations. 656pp. 189 il. 8. new, last edition, 6.00
- 3 Warn R. H. Sheet Metal Worker's Instructor. 178pp. 32 pl. 37 il. 8. new, last edition, 2.40
- 4 Watt A. Electro-Metallurgy. 160pp. 13 il. new, .75
- 5 Wendt. Hanging-Pipe Hot Blast Oven. pl. A.I.M.'86, 10
- 6 Williams W. M. Hollway's Process for Reducing Metallic Sulphides without external Fire. il. 8. unb. '80, 1, .20
- 7 Wollaston W. H. Rendering Platina malleable. pl. 4to. unb. 1829, 1, .30
- 8 Wurtz H. Aluminium. 8. unb. 1854, 1, .10
- Papers from Am. Jour. of Arts and Science.
- 71350 Cooke. Projection of Spectra of Metals. il. '65, 10
- 1 Deville & Debray. Platinum & Metals which accompany it. 1860, .10
- 2 Döbereiner M. Researches respecting Platina. '30, .15
- 3 Hare R. Fusion of Iridium & Rhodium. 1846, .15
- 4 Hayes A. A. Corrosion of Copper-Silver Alloy in Sea-Water. 1851, .10
- 5 Hunt T. S. General Metallurgical Method of Whelpley and Storer. 1867, .10
- 6 Lane. Law of Electric Conduction in Metals. il. '46, .15
- 7 Matthiessen. Expansion of Metals by Heat. '67, .10
- 8 Nickles. Permeability of Metals to Mercury. '53, .10
- 9 Person C. C. Relation between Coefficient of Elasticity of Metals & their latent Heat of Fusion. 1849, .10
- 71360 Phillips J. Thoughts on Ancient Metallurgy and Mining in Briggantia & other Parts of Britain. 1849, 10
- 1 Platinum. Am. Method of Working it. 1862, .10
- 2 Pumpelly R. Notes on Japanese Alloys. '66, .15
- 3 Rammelsberg. Constitution of Titaniferous Ore. '58, .10
- 4 Rose H. New Mode of Preparing Aluminium. '56, .15
- 5 Strange & Anderson. Aluminium Bronze. 1863, .10
- 6 Wharton. Peculiar Products in Nickel Manuf. '70, .10
- 7 Woehler. F. Method of obtaining Iridium and Osmium from the Platinum Residue. 1834, .15
- LEAD, TIN, AND ZINC.
- 71370 Ball. Zinc & Zinc Ores in India. 8. p. 1886, 1, .20
- 1 Blake W. P. Tin. 49pp. 8. p. 1885, new, .10
- 2 Brewster. New Lead Ore, Leadhills. il. 8. unb. '20, 1, .15
- 3 Brooke H. B. Lead Ore from Leadhills. 8. unb. '20, 1, .15
- 4 Charleton. Tin; Mining etc. il. 8. '84, new, 3.40
- 5 Bobb H. History of Lead Mining in Mo., & Austin. Lead Mines in Upper La. 23pp. 8. unb. '74, 1, .20
- 6 Coal Hill, Victoria & Bedford Lead Mines. N. Y. 63pp. pl. 6 sect. 8. '55, 1, Reports by Whitney, Jackson et al., .50
- 7 Coal Hill & Union Mines, St. Lawrence Co., N. Y. 29pp. 3 pl. of sect. il. 8. '52, 1. Reports by Baldwin et al., .35
- 8 Cornwall. Gallium in Am. Blendes. 8. st. '80, 1, .10
- 9 Daniels E. Lead Veins of Wis. 8. unb. 1854, 1, .25
- 71380 Day. Oxidized Tin Ore Crystals. pl. 8. unb. 1799, 1, .25
- 1 Doyle. Tin Mining in Larut. maps, pl. 79, new, 1.25
- 2 Dubuque Lead Region etc. 8. unb. 1865, 1, .15
- 3 Duhamel C. Refining of Lead. 8. unb. 1802, 1, .15
- 4 East Tenn. Zinc Co. 24pp. 8. p. 1866, 1, .50
- 5 Eureka Mining & Manufact. Co. Ky. Lead Property of map, 8. heloth, 1866, 1, .35
- 6 Franklin Co. Mining & Smelting Co. Ky. Report of J. Locke etc. large map, 8. p. 1866, 1, .25
- 7 Gage. Lead Mines. S. E. Mo. 37pp. 8. unb. '74, 1, .35
- 8 Haidinger W. Forms of Crystallization of Sulphate-Carbonate of Lead. 6 il. 3. unb. '24, 1, .20
- 9 Haworth E. Geol. of Lead & Zinc Mining Distr., Cherokee Co. Kans. 47pp. map, 8. p. 1884, 1, .15
- 71390 Hodge T. Ulster Lead Mines. 8. unb. '54, 1, .15
- 1 Hume. Queensland Tin Field. 31pp. col. map, 8. st. '74, 1, .35
- 2 Hunt R. Papers, 8. unb. '48, 1. Hist. of Cardiganshire Lead Mines. 20pp., .35; Produce of Lead Ore and Lead in England. 1845 & '46, .20
- 3 Jackson C. T. Papers, 8. unb. 1. Tin Veins of Jackson, N. H. '43, .25; Tin Ore at Winslow, Me. B. '69, .10
- 4 Karsten. Beimischungen welche die Festigkeit des Zinkes vermindern. 37pp. 8. unb. '42, G. 1, .30
- 5 Kersten C. M. Chem. Zusammensetzung mehrerer Zinnsorten. 29pp. 8. unb. 1848, G. 1, .25
- 6 La Motte Mines & Domain, Mo. 16pp. 8. p. '38, 1, .50
- 7 Lange. Veränderungen bei den Blei-Schmelzprozessen auf Friedrichshütte. pl. 8. unb. '51, 1, .25
- 8 Meeker M. Early History of the Lead Regions of Wis. 26pp. 8. unb. 1872, 1, .25
- 9 Mentzel. Papers, 8. unb. G. 1. Vollständiger Benutzung des Brennmaterials bei Zinkdistillationsöfen. 15pp. 2 pl. '48, .30; Gasflammenofen fuer den Zinkdistillationsprozess. 20pp. pl. '50, .20
- 71400 N. J. Zinc Co. Annual Reports. 1853 et seq. 8 p. 1, .20
- 1 Norwood C. J. Lead Region of Henry Co. Ky. with Notes on Owen and Franklin Cos. 32pp. 3 pl. 8. p. 1, .20
- 2 Percival J. G. Hazelgreen Mine. Wis. 8. unb. '54, 1, .15
- 3 Percy. Metallurgy of Lead. 583pp. 155 il. 8. '70, new, 4.60
- 4 Phillips. Upper Miss. Lead Regions. il. 8. unb. '54, 1, .15
- 5 Pulsifer W. H. History of Lead and Manufacture of White Lead and Lead Oxides. 1888, new, 3.20
- 6 Quick. Old Stannaries of England. 8. unb. '79, 1, .20
- 7 Raymond. So. Mo. Zinc Deposits. A. I. M. '79, .10
- 8 Reyer E. Zinn in Australien. 24pp. G. '80, 1, .35
- 9 Richards. Lead Vein. Newburyport, Mass. B. '74, .20
- 71410 Richardson. Louisville Mine, Mass. il. 8. unb. '54, 1, .15
- 1 Robertson A. Analysis of Galena. 8. unb. 1829, 1, .20
- 2 Schmidt & Leonhard. Lead and Zinc Regions of S. W. Missouri. 203pp. 4 maps. 8. unb. '74, 1, 1.00
- 3 Schoolcraft H. R. Lead Mines of Mo. & Mineralogy etc. of Mo. & Ark. 299pp. 3 pl. 8. hef. 1819, 3, 2.00
- 4 Shaler N. Origin of Galena Deposits of Upper Cambrian Rocks of Ky. 54pp. il. 8. p. 1, .30
- 5 Smithson J. Native Minium. 8. unb. 1806, 1, .10
- 6 Streckner W. Zink-Huettenwesen in den Vereinigten Staaten von N. Am. 72pp. 24 il. 8. unb. '79, G. 1, .50
- 7 Strong M. Geol. & Topography of Lead Regions of Wis. 108pp. 8 pl. (some col.) 5 l. maps, 8. unb. '77, 1, 1.50
- 8 Swallow G. C. Geol. Report on Country along S. W. Branch of Pacific R. R. Mo. 110pp. (37 on lead) 2 pl. 8. '59, 1, .40; or p. 1, .25
- 9 Sullivan & O'Reilly. Hydrocarbonates & Silicates of Zinc of Santander, Spain. 21pp. 8. unb. '62, 1, .35
- 71420 Troost. Zinc Ores, Franklin & Sterling, N. J. P. A. C. J. '25, .20
- 1 Teschemacher. Oxides of Tin. Mass. 8. unb. '43, 1, .50
- 2 Ural Mineral Co. Iowa Co. Wis. 2 pl. 8. p. '64, 1, .25
- 3 Williams C. P. Papers, 8. unb. '77, 1. Lead Industry of Mo. 95pp., .40; Zinc Industry of Mo. 20pp., .25; Lead and Zinc Statistics, .15
- 4 Witham. Lead Mines of So. Spain. 8. unb. '27, 1, .20
- 5 Woehler. Lead Phosphates & Arseniates. 8. unb. '26, 1, .20
- 6 Wulfen X. De Plumbo Spathoso Carinthiaco. 108pp. 21 pl. 46 finely col. fig. 4to. hef. 1791, L. 2, rare, 7.50
- 7 Wurtz H. Troostite from N. J. A. A. S. 1851, .10

IRON AND STEEL.

(For other papers, books, etc., see references under Mineralogy, etc.)

- 70820 Abbott. Value of Steel Castings. A.I.M. '85. .10
 1 Abel F.A. Chemistry of Iron. 8. unb. 1857, 1. .15
 2 Adams. Pyrites, Louisa Co. Va. pl. A.I.M. '84. .15
 3 Akerman R. State of the Iron Manufacture in Sweden 1876. 71pp. large col. map, 4to. p. 76, 1. .30
 4 Alexander J.H. Report on the Manufacture of Iron. First & Second Reports in 1 vol. 461pp. 3 pl. 14 fig. 8. sh. 1840, 2, printed by order of Senate of Md. very rare, 5.00
 5 Am. Iron and Steel Association Reports of the Secretary. 8. p. 1, each about 30pp., .25
 6 " Proceedings including the Report of the Secretary. 8. p. 1, each about 100pp., .25
 7 Ansted. Coal & Iron Fields of Va. il. 8. st. '74, 1. .30
 8 Ashburner & Sheaffer. Township Geol. of Elk. Forest & Cameron Cos. of Pa. (Iron of Cameron Co. etc.) 383pp. 2 maps, 3 pl. 142 il. & Atlas of 8 maps, 8. '85, 1. .50
 9 Audibert. Betrieb der Eisenhuetten in der Lombardei. 76pp. 8. unb. 1844, G. 1. .50
 70830 Bachman F.E. Phosphorus Determinations in Pig Iron and Steel. A. I. M. 1882. .15
 1 Baker G. W. Mineral Belt of Sussex Co. N. J. Stirling Hill—Mine Hill. Zinc, Iron and Manganese, (Franklinite). 115pp. 2 maps (1 col.), 13 pl. il. 8. '81, 1. .15
 2 Barba J. Use of Steel. 110pp. il. '75, new, last ed., 1.20
 3 Barnes P. Papers, A. I. M. Water Supply at Bessemer Steel Works. Edgar Thomson Steel Co. '78, 20; Forms of Ports for Steel-melting Furnaces. pl. 9 fig. '80. .15; Water Gas Furnace, Elgin, Ill. '83, 10; Fuel Economy in Engines and Boilers. '85. .10
 4 " Steel Industry in the U. S. 85pp. 8. p. '85, 1. .20
 5 Bartlett J. H. Papers, A. I. M. Manufacture of Iron in Can. 35pp. '85, 20; Canadian Iron Trade. 18pp. '87, 15
 6 Barus & Strouhal. Electrical & Magnetic Properties of Iron Carburets. 238pp. 31 il. 8. p. '85, new. .25
 7 Baerman. Metallurgy of Iron. 414pp. 46 il. '68, 2. 1.00
 8 Bayles J. C. Papers, A. I. M. Microscopic Analysis of Struct. of Iron & Steel. 4 il. '83, 25; Study of Iron & Steel. 84, 10; Spirally-welded Tubing. il. .10
 9 Beardsley A. Crystals of Iron. 5 il. 8. unb. '79, 1. .15
 70840 Beckert T. Leitfaden der Eisenhuettenkunde 424pp. 3 pl. 155 il. 8. 1885, G. new. 3.00
 1 Bell L. L. Principles of the Manufacture of Iron and Steel. 744pp. 8. 1885, new. 4.80
 2 " Phenomena of Iron Smelting. il. 8. new, last ed., 9.00
 3 " Notes on Coal and Iron Mines and Iron Works in the U. S. 70pp. 8. p. 1875, 1. .50
 4 " Economy in the Blast Furnace for Smelting Iron. 45pp. col. pl. 8. p. 1874, 1. .35
 5 Belle Monte Iron & Coal Co. of Col. Statement and Reports by G. W. Maynard et al. 23pp. 4 pl. 8. p. 66, 1. .35
 6 Bessemer Process & Works in U. S. 39pp. 8. p. '68, 1. .30
 7 Berkinbine J. Papers, A. I. M. Production of Charcoal for Iron Works. '78, 10; Experiments with Charcoal, Coke and Anthracite in Pine Grove Furnace. '79, 10; Blast-Furnace Hearths & Linings. '81, 10; Roasting Iron Ores. 19pp. pl. 5 il. '83, 15; Cerro de Mercado (Iron Mountain) Durango, Mex. 19pp. '84, 15; Blast-Furnace Records. 23pp. 5 il. '86, 10; Operation of Warwick Furnace, Pa., Aug. 27, '86 to Sept. 1, '85. 38pp. '85, 20; Distribution and Proportions of Am. Blast-Furnaces. '87, 10; Tilting Ladle Car for Molten Metal or Slag. il. '87. .10
 8 Blair. Chem. Analysis of Iron. 282pp. 8. '88, new. 3.20
 9 Blake W.P. Metallurgy of Iron and Steel. 320pp. 3 pl. 138 il. 8. unb. 1876, 1. .30
 70850 " Iron Ore Deposits of S. Utah. A. I. M. '86. .10
 1 Bodmer. Machinery for Slag Bricks. 3 pl. 8. unb. '74, 1. .25
 2 Boman. Bessemer in Sweden. 53pp. pl. 8. p. '64, 1. .25
 3 Bower. Bower-Barff Process. pl. 6 fig. A. I. M. '83. .10
 4 Bowron W. M. Cost of a Ton of Pig Iron in the Sequachee Valley. A. I. M. 1888. .15
 5 Boyd C. R. Ores of Cripple Creek, Va. A. I. M. '83. .10
 6 Brady's Bend Iron Co. Real Estate etc. 63pp. map, geol. sect. 8. p. '58, 2, Analyses of Ores etc., .50
 7 Brainerd A. F. Papers, A. I. M. Hematite of Franklin Co. Vt. '85, 10; Carbonate Iron Ore, Enterprise, Miss. '87, 10; Henderson Steel. '88, 10; Iron Ores etc. of Birmingham District. '88. .10
 8 Brief of Title to "Douthet Survey, Bath & Allegheny Cos. Va. (Trotter's Surv.) 28pp. col. map, 8. p. '66, 1. .30
 9 Brooks. Lake Superior Iron Region. 8. stitched, '80, 1.15
 70860 Buchan P. Composition of the Iron Ores of the Connaught Coal-field. 27pp. 8. unb. '58, 1. .20
 1 Cabot. Temperature in Steel Making. A. I. M. '86. .10
 2 Caldwell. Iron and its Impurities. 21pp. 4to. p. 1. .35
 3 Calvert & Johnson. Chem. Changes in Pig Iron during its Conversion into Wrought Iron. 8. unb. '57, 1. .15
 4 Campbell. Open-Hearth Steel. A. I. M. '85. .10
 5 Chapman E. J. Titaniferous Iron Ore in Haliburton and Hastings Cos. Ontario. 4to. unb. '84, 1. .15
 6 Chauvenet. Blast Furnace Binding. il. A. I. M. '81, 25
 7 Cheever B.W. Papers, A. I. M. Estimation of Manganese, Carbon & Phosphorus in Iron & Steel. il. '85, 15; Campbell's Calorimetric Process for estimating Phosphorus in Iron & Steel. '85, 15; Two Conditions of Phosphorus in Iron (2 Papers) 18pp. '86, 20; Segregation of Impurities in Bessemer Steel Ingots on Cooling. il., .10
 8 Cheney. What is Good Iron? 40pp. 8. stitched, '62, 1. .35
 9 Chester A.H. Iron Region of N. Minn. 8. unb. '84, 1. .25
 70870 Clark. Great Blast at Glendon. 28pp. il. A. I. M. '79, 25
 1 Clibborn. Combustion of Iron. 8. unb. 1862, 1. .15
 2 Cloud J.W. Steel for Bridges. 4 il. A. I. M. '81. .20
 3 Collett J. Geol. of Martin Co. etc., Ind. (much on Iron and Coal.) 228pp. 6 pl. 3 maps, il. 8. unb. '71, 1. .25
 4 Collier J. Obs. on Iron & Steel. pl. 8. unb. 1798, 1. .20
 5 Col. Coal & Iron Co. Reports, each about 25pp. 8. p. 1, 25
 6 Colquhoun H. Metallurgic Memoir on Nature & Hist. of Argillaceous Carbonate of Iron. 89pp. unb. '27, 1. .75
 7 Cook E.S. Anthracite & Coke, separate and mixed, in the Warwick Blast Furnace. A. I. M. '88. .15
 8 Cooper. Blue Iron Earth of N. J. A. P. Trans. '18. .20
 9 Crowder W. Average Composition of the Rosedale, Whitby & Cleveland Ironstones. 18pp. 8. unb. '57, 1. .20
 70880 Coutie W. Atoms of the Elements; or Iron and the other Elements. 30pp. il. 8. p. Troy 1887, 1. .30
 1 Cox E. T. Cost of making Bessemer Iron in Indiana. 8. unb. 1879, 1. .15
 2 Cozzens. Iron Ores from N. New York. N. Y. L. '24. .25
 3 Dacosta. Native Iron, Leadhills. 8. unb. 1818, 1. .20
 4 D'Aligny H. Iron Region of Hanging Rock, Ky. 53pp. col. map, 8. p. 1870, 1. .50
 5 Daniels. Iron Ores of Wisconsin. 8. unb. 1858, 1. .20
 6 " F.H. Gas Producers Using Blast. 2 pl. A. I. M. '81, 20
 7 Dawson J.W. Geol. Relation of the Iron Ores of Nova Scotia. il. A. A. S. '74. .15
 8 Day. Early Use of Iron. 34pp. pl. il. 8. p. '73, 3. .35
 9 Dechen. H. v. Vorkommen des Rotheisenstein in der Gegend von Brilon. 131pp. 8. unb. '45, G. 1. .75
 70890 DeKoninck & Dietz. Chem. Analysis & Assaying as applied to Manufact. of Iron. 282pp. new, last ed., 2.00
 1 Delano. Manufacture of Steel Rails. A. I. M. 8.8. .10
 2 Descostils. Chem. Obs. on Spathic Iron. 8. unb. '06, 1.20
 3 Devereux. Iron Deposits, Pitkin Co. Col. A. I. M. '84, 10
 4 Dewees. J. H. Fossil Iron Ore Beds of Middle Penna. 344pp. 7 geol. maps, 19 sect. il. 8. '78, 1. .75
 5 Dewey F. P. Papers, A. I. M. Rich Hill Iron Ores. 1881, 10; Some Canadian Iron Ores. 1888. .10
 6 D'Invilliers E. V. Geol. of Centre Co. Pa. (Iron Ores. Mines etc.) 482pp. col. geol. map, 15 il. 8. 1884, 1. .50
 7 " Cornwall Iron Ore Mines, Lebanon Co. Penna. 32pp. map, 2 pl. il. 8. p. '86, 1. .20
 8 Directory to the Iron & Steel Works in U.S. pub. by Am. Iron & Steel Assoc. 184pp. 8. 1880, new, 35; or, corrected to 1886. 218pp. '86, new. .60
 9 Drapier. Anal. of Spathic Iron Ore. 8. unb. 1806, 1. .10
 70900 Drown & Shimer. Analysis of Iron Ores. A. I. M. '81, 10
 1 Dudley & Pease. Const. of Cast Iron. A. I. M. '86. .10
 2 Dufrenoy M. Use of Hot Air in the Iron Works of England & Scotland. 103pp. 10 pl. 8. 1836, 2. .75
 3 Durfee W. F. Chem. Laboratory at Wyandotte, Mich. 1863. 15pp. 9 il. A. I. M. '83. Analyses of Iron Ores. .15
 4 Ebelen. Gasarten die sich beim Betriebe der Hochoefen etc. entwickeln. 65pp. pl. 8. unb. '44, 1. .40
 5 Eck. Papers, 8. unb. G. 1. Raffinieren des Coaks Rotheisen in Gas Flammhoefen. 26pp. 2 pl. 21 fig. '46, 30; Betrieb der Coakshoefen in Belgien. 68pp. pl. 8 fig. '50, 50
 6 Ede. Manufacture of Steel. 221pp. 4th ed. '67, 1. 1.00
 7 Egleston T. Papers, 8. p. 1. Investigations on Iron and Steel Rails in Europe. '73. 62pp. 7 il. '76, 35; Manufacture of Charcoal in Kilns. 25pp. 8 il. '79, 20; Am. Bloomery Process. 36pp. 8 pl. 98 fig. '80, 25; Basic Refractory Materials. 38pp. 17 il. '85, 20; Basic Bessemer Process. 44pp. 3 pl. 16 il. '85, 25; Going into Blast with Anthracite Furnaces. pl. '85, 10; Basic Open Hearth Steel Process. '85, 20; Some Physical Properties of Iron & Steel. '85, 10; Haswell and Whitworth's Steel Forgings. '85, 10; Furnace Terms in English, French & German. 22pp. 15 il. '88. .15
 8 Ellis R. W. Iron Ore Deposits of Carleton Co., New Brunswick. map, 8. unb. 1876, 1. .25
 9 Emmerton F. A. Rapid Method for Determination of Phosphorus in Steel etc. A. I. M. '85. .15
 70910 Eustice. Direct Process for Fine Iron Ores. A. I. A. '80. .15
 1 Fackenthal. Durham Furnace. 2 pl. A. I. M. '85. .10
 2 Fairbairn W. Application of Cast and Wrought Iron to Building Purposes. 192pp. 2 pl. 62 il. 8. '54, 2. .40

- 3 Fairbairn W. Iron, its History, Properties and Processes of Manufacture. 309pp. 74 il. S. 1865, 1, .100
- 4 " Barrow, Hematite Steel. 51pp. photos. il. S. '69, 1, .75
- 5 Firmstone F. Papers, A. I. M. Indicator Cards from Water Pressure Blowing Engine. il. '79, .10; Improved Langen Charger. pl. '84, .10; Incrustations on Pig Iron. '84, .10
- 6 Fleming, Ores used in Chattanooga Dist. A. I. M. '87, .10
- 7 Flight W. Quantitative Separation of Iron Sesquioxide Alumina & Phosphoric Acid. S. p. 1875, 1, .20
- 8 Ford S. A. Papers, A. I. M. '81. Amount of Manganese required to remove Oxygen from Iron in the Bessemer Process. .10; Estimation of Manganese in Irons etc. .10
- 9 Forsyth R. Bessemer Plant of N. Chicago Rolling Mill Co. at South Chicago. 21pp. 4 pl. A. I. M. '85, .15
- 70920 Foster. Notes on Haylor Iron Mine. S. unb. '75, 1, .15
- 1 Francis J. B. Strength of Cast-iron Pillars, with Tables. 69pp. il. S. unb. 1865, 1, .50
- 2 Frazer P. Iron Ore Belt and Mines of York & Adams Co. Penna. 206pp. 8 maps & sect. 4 pl. S. 1876, 1, .50
- 3 " Magnetic and Micaceous Ore Bed in York, Adams, Cumberland & Franklin Cos. Pa., Dillsburg Ore Bed, etc. 200pp. 12 maps & sect. 5 pl. S. '77, 1, .60
- 4 " Geol. of Lancaster Co. Pa. 360pp. 12 col. pl. and Atlas of 12 maps and sect. (some col.) of Chestnut Hill Iron Ore Banks etc. S. 1880, 1, .60
- 5 " Iron Ores of the Middle James River. 16pp. 2 large maps. A. I. M. 1881, .15
- 6 French B. F. History of Rise & Progress of Iron Trade in U. S. 1621 to 1857. 195pp. S. 1858, 2, .25
- 7 Fulton J. Papers, A. I. M. Coke for Blast Furnace Use. '83, .10; Iron Ores of the Menominee Range, Mich. 9 il. '87, .10; Methods of Mining the same. il. '87, .10
- 8 Gage J. R. Iron Ores in Mo. S. unb. 1873, 1, .15
- 9 Garrett. Open Hearth & Bessemer Steel. A. I. M. '86, .15
- 70930 Garrison F. L. Papers, A. I. M. Microscopic Struct. of Car Wheel Iron. 4 il. '86, .10; Sp. Gravity of Low Carbon Steel. '86, .10; Microscopic Struct. of Steel Rails. 7 il. '87, .10; Microscopic Struct. of Iron and Steel. 15pp. 2 pl. 11 fig. '87, .20; Hugsfel's Improved High Bloomery for producing Iron and Steel direct from the Ore. 22pp. 8 il. '88, .15
- 1 Gatewood. Hard Centres in Steel Ingots. A. I. M. '85, .10
- 2 Gayley. Chilled Furnace Hearth. il. A. I. M. '86, .10
- 3 Gilpin. Iron Ores, Pictou Co. N. S. map. A. I. M. '85, .10
- 4 Giers J. Rolling Steel Ingots with their own Initial Heat. pl. A. I. M. 1884, .15
- 5 Gordon F. W. Papers, A. I. M. Whitwell Firebrick Hot Blast Stove & Improvements. pl. '81, .15; Boiler and Boiler Settings for Blast Furnaces. pl. '83, .15; Blast Furnace of N. Chicago Rolling Co. '85, .10; Large Furnaces on Alabama Material. '88, .10
- 6 Great Britain's Iron Trade '30 to '55. S. unb. '55, 1, .10
- 7 Great Western Iron Co., Charter etc. 16pp. 8 p. '36, 1, .25
- 8 Green. Ferruginous Earth, Del. S. unb. '84, 1, .15
- 9 Greener T. Greener & Ellis Patent Oxide Dry Bottoms for Mill Furnaces. S. unb. 1873, 1, .20
- 70940 Greenwood. Steel & Iron. 536pp. 97 il. new. J. ed., 1.60
- 1 Gridley E. Papers, A. I. M. Cast Iron of Unusual Strength. '83, .10; Grade of Iron from Carbonate Ore. '84, .10
- 2 Gruner. Manufact. of Steel. pls. S. '72, new, last ed. 3.00
- 3 " Blast Furnace Phenomena. 186pp. S. new, 1. ed., 2.00
- 4 Hackney W. Manufacture of Steel & Smith J. T. Bessemer Steel Rails. 130pp. 3 pl. 25 fig. il. S. p. '75, 1, .50
- 5 Hall et al. Fort Ann Hematite and Magnetic Ore Co. N. Y. 16pp. S. p. 1869, 1, .50
- 6 Harrington B. J. Iron Ores of Canada. 70pp. 8 p. '74, 1, .50
- 7 Hartmann C. Praktisches Handbuch der Stahlfabrikation. 519pp. 8 pl. 82 fig. hmo. 1861, G. 1, 1.00
- 8 " H. Papers, S. unb. 1. Manufacture of Spiegeleisen. 53pp. 7 pl. 15 fig. S. unb. '72 & '74, .60; Iron and Steel Industries of Rhenish Prussia & Westphalia at the Vienna Exhibition '73. 58pp. map, '74, .25
- 9 Hartman J. N. Papers, A. I. M. Improved Pipe & Tuyere. il. '78, .15; Regenerative Stoves. pl. 5 fig. '79, .20; Notes on the Blast Furnace. pl. 4 fig. '80, .10
- 70950 Hassenfratz J. H. La Siderotechnie ou l'Art de Traiter les Minerais de Fer etc. 4 vol. 1563pp. 65pl. nearly 1400 fig. 4to. hef. 1812, F. 3, 5.00
- 1 Hatchett C. Analysis of Magnetical Pyrites and Remarks on other Sulphurets of Iron. 23pp. S. unb. '05, 1, .30
- 2 Healey. The Siemens Furnace. 16pp. 2 pl. S. unb. '71, 1, .25
- 3 Heated Air in Smelting of Iron. S. unb. '32, 1, .15
- 4 Helmacker R. Ueber das Eisenhuettenwesen in Bosnien. S. unb. G. 1873, 1, .15
- 5 Herriek J. A. The Eighty Ton Steam Hammer at Creusot. Text. 5 pl. 15 fig. A. I. M. '80, .25
- 6 Hewitt A. S. Statistics and Geography of the Production of Iron. 39pp. pl. S. p. 1856, 1, rare, .75
- 7 " Production of Iron and Steel in its Economic and Social Relations. 87pp. S. p. '70, 1, .20; or unb. 1, .10
- 8 Hill. Management of Structural Steel. A. I. M. '83, .10
- 9 Hingenau. Bessemer in Oesterreich. 104pp. 8 p. '65, 3, .35
- 70960 Hoare. Iron and Steel. 5th ed. 1874, new, 1.75
- 1 Hodge J. T. Manufact. of Iron Blooms. il. S. unb. '54, 1, .15
- 2 Hodgkinson E. Strength and other Mechanical Properties of Cast Iron. 79pp. pl. S. unb. '38, 1, .75
- 3 Holley A. L. Papers, A. I. M. Pressing Needs of our Iron and Steel Manufactures. 25pp. '75, .15; Strength of Wrought Iron as affected by its Composition etc. 24pp. '78, .20; Tessie Gas Producer. 6 il. '79, .10; Washing Phosphoric Pig Iron for Open Hearth etc. Processes at Krupp's Works. pl. 2 fig. '79, .15; Pernot Furnace. 15pp. large pl. '79, .20; U. S. Testing Machine at Watertown Arsenal. '79, .10; Notes on Siemens's Direct Process. pl. 6 fig. '80, .10; Rail Patterns. 16pp. 2 pl. '81, .10
- 4 Homes H. A. Notice of P. Hasenclever, an Early Iron Manufacturer. S. unb. 1876, 1, .25
- 5 Hood. Change in Internal Struct. of Iron. S. unb. '42, 1, .15
- 6 Howe H. M. Papers, A. I. M. Cure for Blast Furnace Chills. 20pp. '83, .15; Contraction of Iron on Sudden Cooling. '85, .10; Uniformity in Bessemer Process. '86, .10
- 7 Huenefeld. Titaniferous Iron Slag. S. unb. '28, 1, .15
- 8 Hull E. New Iron Fields of Engl. il. S. unb. '66, 1, .20
- 9 Hungerford. Soft Ore Bodies, Low Moor. il. A. I. M. '88, .10
- 70970 Hunt T. S. Papers, S. unb. 1. Metallurgy of Iron etc. 39pp. '57, .20; Metallurgy of Iron and Processes of Chenot. '68, .25; Am. Iron Sands (Abstract) A. A. S. '71, .10; Iron etc. of Hocking Valley, O. A. I. M. '79, .15
- 1 " R. Iron and Steel. 20pp. S. unb. 1862, 1, .25
- 2 " R. W. Papers, A. I. M. Further Notes on Clapp and Griffith's Process. '85, .10; Soft Steel for Boiler Plates. '86, .10
- 3 " A. E. Papers, A. I. M. Estimation of Manganese in Iron by the Color Method. '86, .10; Recent Improvements in Open Hearth Steel Practice. 35pp. '88, .15
- 4 Huntington. Iron Ore of Bartlett. N. H. B. '49, .15
- 5 Hutchinson E. Construction and Arrangement of Works for Manufacture of Iron. 20pp. 2 pl. S. unb. '72, 1, .30
- 6 Iron, the Basis of Modern Industry. S. unb. '64, 1, .15
- 7 Iron Manufacture, Economy in its Production—Improved Form of Blast Furnace. pl. S. unb. '58, 1, .15
- 8 Iron Ores of Lake Champlain or the Adirondack Region. 16pp. col. map, sect. il. S. p. 1867, 1, .35
- 9 Iron, Steel and Allied Trades. '81. 119pp. S. p. '82, 1, .50
- 70980 Iron & Steel Manufactures & Iron Ore Producers Convention. Proceed. Pittsburgh, '79. 46pp. S. p. 1, .15
- 1 Irving R. D. Iron Ores of Wis. 24pp. S. unb. '83, 1, .50
- 2 Jackson. Brunswick & Acadia Iron Mines. S. unb. '56, 1, .15
- 3 Jacobus D. S. Efficiency of a Steam Boiler using Waste Gas of Blast Furnace as Fuel. A. I. M. '88, .10
- 4 Jeans. Scotch Malleable Iron Trade. 19pp. S. unb. '73, 1, .20
- 5 Johnson W. R. Use of Anthracite in the Manufacture of Iron. 162pp. il. 1841, 1, .75
- 6 " G. Preser ation of Wrought & Cast Iron and Steel from Rust etc. 24pp. pl. 5 fig. S. stitched, '42, 1, .50
- 7 " C. F. Iron Ore Production in U. S. '80. 4to. st. 1, .15
- 8 Jones F. F. Improved Machine for Making Wrought Iron Rails. 16pp. 6 pl. 15 fig. S. unb. 1871, 1, .30
- 9 " C. Silica in Blast Furnace Cinder. A. I. M. '87, .10
- 70990 Journal of U. S. Assoc. of Charcoal Iron Workers. Harrisburg. Nos. each about 50pp. pls. S. p. 1, .50
- 1 Journal of the Iron & Steel Institute, London. 1872 to '85, about 2000pp. many pls. & il. S. p. & cloth, 1, 110.00; or, Vols. p. from 2.00 to 10.00; or, Parts, p. 75 to 1.50
- 2 Joy. Disintegration of Slag. Text. 6 pl. S. unb. '73, 1, .30
- 3 Julian F. Papers, A. I. M. Determination of Phosphorus in Iron. '84, .10; Estimation of Manganese in Steel. '88, .10
- 4 Julien A. A. Variation of Decomposition in the Iron Pyrites, its cause etc. 30pp. N. Y. Lye. '85, .30
- 5 Jullien. Theorie de la Trempe. 32pp. 4to. p. '65, F. 1, .35
- 6 Karsten C. J. B. Handbuch der Eisenhuettenkunde. 2 vol. 1386pp. 2 pl. 8 p. G. orig. ed. 1826, 1, 1.00
- 7 " Same in French. 3 vol. 1580pp. 19pl. 202 fig. S. '30, 2, 3.00
- 8 " G. Hygrometrische Tabellen zur Anwendung bei Gabelsen etc. 87pp. S. unb. 1847, G. 1, .50
- 9 Kennedy J. Papers, A. I. M. Blast Furnace Working. il. '80, .10; Hot Blast Stoves. pl. '81, .15
- 71000 Kent W. Papers, A. I. M. Phenomena in testing Bessemer Steel. pl. '79, .15; Manganese Determination in Steel. '81, .15; Water-Tube Boilers at Lucy Furnaces. pl. '84, .10; Apparatus for Determining Heating Power of Fuels. il. '86, .10; Failures of Steel Boiler Plates. '86, .10
- 1 Kimball J. P. Papers, A. I. M. Flux for Rolling Mill Cinder etc. '80, .10; Self fluxing Properties of Chateaugay Magnetite from Clinton Co. N. Y. '80, .15; Iron Ore Range of Santiago District, Cuba. 22pp. '85, .15
- 2 Kingston. Haylor Iron Mine. il. S. unb. '28, 2, .20
- 3 Kohn F. Iron and Steel Manufacture. 282pp. 64 pl. 350 fig. 4to. hmo. 1868, 2, pub. at 15.00, 4.00

- 4 Krans M.F. Four a Gaz et a Chaleur Regenerée du M. Siemen. 144pp. 5 pl. 33 fig. 8. Immo. '69. F. 1. 1.50
- 5 Kuehn R. Frischmethode ueblich im Berner u. Französischem Jura. 17pp. 8. unb. 1845. G. 1. .20
- 6 Kurtz & Brown. Effects of Sea Water etc. upon Iron Pile Shafts. 13pp. 4 pl. 4to. helioth. 1874. 2. .35
- 7 Landrin. Traite on Steel. 352pp. new, last ed., 2.40
- 8 Lane. Magnetic Attract. of Iron Oxides. 8. unb. '06. 1.15
- 9 Larsson P. Chapin Iron Mine. pl. A.I.M. '87. .15
- 1019 Lardner. Iron and Steel. 349pp. 90 il. '81. 2. .25
- 1 Laureau L. G. Bessemer Converting House without a Casting Pit. pl. il. A. I. M. '85. .10
- 2 Le Blanc & Walter. Metallurgie Pratique du Fer. 2 vol. 612pp. 4to. p. '36. F. 1. no plates. .50
- 3 Lecount P. Changeable Magnetic Properties of Iron Bodies etc. 55pp. il. 8. bds. 1820. 1. .50
- 4 Lee R. H. Opening of a Chilled Hearth with the Coal-oil Blowpipe. il. A. I. M. 1886. .15
- 5 Le Play F. Methode Nouvelle pour la Fabrication du Fer. 205pp. 7 pl. 8. Immo. 1853. F. 1. 1.00
- 6 Lesley J. P. Iron Manufacturer's Guide to Furnaces, Forges & Rolling Mills of U. S. 807pp. 6 pl. il. S. '59. 1. 2.50; or, 3. 2.00
- 7 " Report on Geol. Surv. of Pa. (very full on Cornwall Iron Ore Mines etc.) 748pp. 5 maps (some col.) 13 pl. of Iron Mines etc. 47 il. S. '86. 1. 1.25
- 8 " Occasional Surveys of Iron, Coal and Oil Districts in U.S. 206pp. 7 pl. & maps, (some col.) il. S. '74. 1. 2.50
- 9 " Papers, A. P. Lignite in Iron Ore, Pond Bank, Pa. 20pp. 4 col. pl. '64. '35; Brown Hematite Ore Banks, Huntingdon & Centre Cos. Pa. & Genl. Investigations of Iron Ores. 65pp. map, 44 il. '74. '75; Titaniferous Iron Ore Belt near Greensboro, N.C. 20pp. 15 il. '71. 20
- 1020 Lewis H. C. Papers, Montgomery Valley Iron Ores P. A. S. '80. 10; Brandon Period Iron Ores. A.A.S. '81. 10
- 1 Long. New Regenerative Blast Oven. il. A.I.M. '85. .10
- 2 Lord. Highly Phosphuretted Pig Iron. A.I.M. '84. .10
- 3 Lyman B.S. Papers, Lower Silurian Hematite Beds of Am. A. S. '68. '20; Staley's Creek etc. Iron Ore Region, W. Va. 15pp. map, A. P. Trans. '73. '20; Geol. of Low Moor, Va., Iron Ores. il. A. I. M. '86. .10
- 4 McCreath. Iron Ores of Valley of Va. A. I. M. '83. .10
- 5 McCulloch. Black Lead from Cast Iron. S. unb. '22. 1. .10
- 6 Macdonald. Rolling Steel Eye Bars. il. A.I.M. '79. .10
- 7 Manners. Bessemer Converters Bottom. il. A.I.M. '81. 10
- 8 Manufacture of Iron. 114pp. 13 il. '37. 1.30; or, 32pp. 13 il. S. p. 1. .20
- 9 Marotock Iron Co. N.C. Property. 8. p. 1872. 1. .35
- 1030 Mattes W.F. Rail Sections. 22pp. 26 il. A.I.M. '87. 15
- 1 Maw W. H. Attainment of High Heats in Furnaces. 47pp. 6 pl. 14 fig. 8. unb. 1871. 1. .35
- 2 Maynard G.W. Siemen's Direct Process. A.I.M. '82. 20
- 3 Meier E.D. Heine Safety Boiler. il. A.I.M. '86. .10
- 4 Memorial from Penna. to U.S. Congress on the Manufacture of Iron etc. 115pp. 11 tables. 8. p. 1850. 1. .35
- 5 Merritt W. H. Papers, N. Staffordshire Coal & Iron Dist. A. I. M. '80. 10; Ontario Magnetic Iron Ore A. S. '81. .10
- 6 Michaelis. Bofor's Steel Cast Guts. A.I.M. '88. .10
- 7 Miller. Sp. Gr. of Low Carbon Steel. A. I. M. '85. .10
- 8 Mo. Iron Co. & Mo. & Iron Mountain Cities. 40pp. map. 8. p. '37. 1. Letters from Schoolcraft et al. .35
- 9 Moore P. N. Iron Ores in the Vicinity of Cumberland Gap, Ky. 14pp. pl. of sect. 8. p. n. d. 1. .20
- 1040 " Airdrie Furnace & Property, Ky. 28pp. 8.74.1. 15
- 1 Mushet D. Papers, 8. unb. 1. Strictures on Collier's "Obs. on Iron and Steel." 1798. 15; Principles of Iron and Steel. 1798. 15; Hist. Researches on Manufact. of Iron and Steel. 1798. 20; Materials for Cast Iron. 18pp. pl. 1799. 15; Component Parts of Iron Stones and their Effect on the Quality of Crude Iron. 36pp. 1799. 35; Primary Ores of Iron. 17pp. 1799. 15; Calcareous Stones in Manufact. of Crude Iron. 15pp. 1799. 15; Assaying Iron Ores and Iron Stones by Fusion. 28pp. 1799. 30; Assay Furnace. pl. 1799. 15; Blast Furnace with Blowing Machine. pl. 4 fig. 1799. 15; Production of Cast Iron and Operations of the Blast Furnace. 1799. 15; Proportion of Coal and Iron Stones used at the Blast Furnace, etc. 1799. 20; Effects produced by Nature, Compression, etc. of Air in the Blast Furnace. 16pp. 1800. 15; Air and Water Vault to equalize Discharge of Air into the Blast Furnace. pl. 4 fig. 1800. 20; Origin etc. of Manufact. of Iron with Pit Coal etc. 1800. 10; New Method of Making Steel. 1801. 15; Experiments on Conversion of Iron into Steel by means of the Diamond. 1801. 15; Clouet's Process for Making Cast Steel from Bar Iron. 18pp. 1801. 30; Fusion of Malleable Iron with Glass. 1801. 15; Different Proportions of Carbon which constitute various Qualities of Crude Iron and Steel. 21pp. 1801. 20; Air Furnaces for casting large Pieces of Ordnance etc. pl. 1802. 15; Shrink-
- age and Expansion of Cast Iron. 1804. 10; Affinity between Carbon and different Earths, separately or united with the Oxide of Iron. 8pp. 1804. 50; Deoxidation & Reduction of Iron Ores. '20. 15; Alloys of Iron & Copper. '35. 15; Black Band Iron Stone. '64. .15
- 2 Neilson. New York Iron Works. 82pp. 4to. '67. 1. .20
- 3 Nichols. Drift Hematite in E. Tenn. A. I. M. '82. .10
- 4 Nat. Assoc. of Iron Manufacturers, Statistical Report for 1872. 286pp. 5 pl. 8. 1873. 1. .50
- 5 Noeggerath. Eisenstein Formationen des Hunsruecken. 51pp. 8. unb. 1842. G. 1. .30
- 6 Oestberg P. Mitis Castings. A. I. M. 1886. .10
- 7 Oregon Iron & Steel Co. Prospectus etc. 8. p. '82. 1. 1.10
- 8 Osborn H. S. Metallurgy of Iron & Steel. 972pp. 8 pl. 230 il. 8. 1869. 2. pub. at \$10.00, and op., 2.50
- 9 Overman F. Manufacture of Steel. 226pp. 28 il. '51. 1. .50; or, new ed. by Fesquet. 285pp. 28 il. '73. 1.00
- 1050 " Manufacture of Iron. 492pp. 149 il. 8. 1850. 2. 2.50
- 1 Page. Glenmore Iron Estate, W. Va. il. A. I. M. '88. 10
- 2 Pardee. I. P. Roasting Kiln. il. A. I. M. '87. .10
- 3 Pearce J.B. Concise History of the Iron Manufacture of the Am. Colonies up to the Revolution & of Penna. until the present time. 282pp. map, pl. il. '76. new. .30
- 4 Percy J. Russian Sheet Iron. 23pp. 8. p. new. .50
- 5 " Iron Ores of North and North Midland Cos. of England. 97pp. il. 8. p. 1856. 1. .75
- 6 Perkins & Stowe. New Guide to Sheet Iron and Boiler Plate Roller. oblong, new, last ed. 2.00
- 7 Phillips W.B. Phosphate Slag. A.I.M. 1888. .10
- 8 " J.A. Sources & Uses of Iron Pyrites. 2 pl. 8. unb. '79. 1.35
- 9 Platt F. Coke Manufact. of Youghiogheny Valley, Pa., Iron Ores etc.; Fulton, Coking; Pearce & Platt. Nat. Gas in the Manufact. of Iron. 252pp. 17 pl. & maps, il. 8. '76. 1. .50
- 1060 " Geol. of Blair Co. Pa. (Iron Ores, Mines etc.) 311pp. 35 il. & Atlas of 14 col. maps & sect. 8. 1881. 1. 1.50
- 1 Pourcel. Manganese & Carbon in Steel. A.I.M. '82. 10
- 2 Prime F. Brown Hematite Ore Ranges of Lehigh Co. Pa. and Desc. of Mines between Emans, Alburts & Fogelsville. 82pp. map, pl. il. 8. 1875. 1. .15
- 3 " Brown Hematite Deposits of the Siluro-Cambrian Limestones of Lehigh Co. Pa. between Summerville etc. & Lehigh River. 110pp. 5 col. maps, 5 pl. 8. 1878. 1. 25
- 4 Pullman. Hibernia Iron Mine Product. A.I.M. '85. .10
- 5 Pumpelly R. Report on Iron Ores and Coal Fields of Mo. Vol. Text, 671pp. pl. sect. 190 il. 8. '73. 1. and folio Atlas of 14 sheets, unb. 1. 3.00; or, Text alone, 1.00
- 6 " Iron Ores of Missouri and Michigan. 2 vols. Text, il. 8. and folio Atlas, new, last ed., 8.00
- 7 " Iron District of Mich. S. stitched, 1876. 1. .10
- 8 Reese. Burnishing & Ductilizing Steel. il. A.I.M. '81. 10
- 9 Ribeiro C. Minas de Ferro no Distrito de Leiria. 20pp. 4 pl. 4to. 1861. 1. Portuguese. .35
- 1070 Richard & Lodge. Experiments illustrating Descent of Charge in Blast Furnace. 161l. A.I.M. '87. 15
- 1 Riley I. B. Iron Ores and Coal of the "Great Vein" Region, Ohio. 41pp. 2 l. maps. 4 pl. p. 1873. 2. .75
- 2 Roberts F.C. Papers, A.I.M. '88. Calculations of available Heat etc. in the Use of Blast Furnace Gas. 10; Device for Operat. Blast Furnace Charging Bells. il. 10
- 3 " P. Puddling Process, Past & Present. A.I.M. '80. 10
- 4 Robertson. Grading Birmingham Pig Iron. A.I.M. '88. 10
- 5 Roebuck. Phenomena observed in the Air Vault of the Devon Iron Works. pl. 8. unb. 1800. 1. .20
- 6 Rogers. Pridevale Iron Co. Property. 27pp. 8. unb. '54. 1. .25
- 7 Rolker. Col. Iron Ore Deposits. il. A. I. M. '85. .10
- 8 Ruttman F.C. Concentrating Magnetic Iron with the Conkling Jig, Lyon Mt., N.Y. 15pp. 12 il. A.I.M. '88. 15
- 9 St. Mary's Canal Mineral Land Company. Iron Lands. 53pp. 2 maps. 8. p. '64. 1. Analyses by Brush et al., .50
- 1080 Salom. Manufact. of Steel Castings. il. A.I.M. '85. 10
- 1 Samuelson B. Description of Two Blast Furnaces erected at Newport, Engl. 1870. 44pp. 3 pl. il. 8. p. '71. 25
- 2 Sanderson C. Iron, its Commerce and Application to Staple Manufactures. 30pp. 8. unb. 1858. 1. .25
- 3 Sandvik Exhibition of Bessemer Steel. map. 8. p. '76. 1. 10
- 4 Sauvage. Explosionen bei Hochfeuern. 8. unb. '42. G. 1. 15
- 5 Schmidt. Properties of Mo. Iron Ores. 8. unb. '74. 1. 15
- 6 Schroetter A. Krystall. Texture des Eisens von Einfluss auf sein Magnetisch werden. pl. 3 fig. 8. p. '57. 1. 30
- 7 Scott. Reduction of Iron by Peat. 8. unb. '63. 1. .10
- 8 Sharples. Black Band Iron Ore, W. Va. A. I. M. '81. 10
- 9 Shimer P.W. Papers, A. I. M. Titanium Carbide in Pig Iron. '86. 10; Determinat. of Phosphorus in Iron. '88. 10
- 1090 Shinn. Pittsburgh, Resources. 16pp. A.I.M. '79. 15
- 1 Siemens C. W. Gewinnung von Eisen u. Stahl durch directes Verfahren etc. 70pp. 5 pl. il. 8. p. 1874. G. 2. 35
- 2 " Correspondance avec les Administrateurs de la Soc. des Aciers Martin. 25pp. 6 pl. 4to. p. 1878. F. 1. .50
- 3 Silliman J. Exam. of Bessemer. Flame. A.A.S. '71. 15

- 4 Smith E.A. Iron Ores of Ala. 8. p. 79, 1, 25; or unbl. 1, 15
- 5 " E.F. Decomposition of Chromic Iron. A. B. 77, 10
- 6 Smock, Distribution of Iron Ores of E.U.S.A.I.M. '88, 10
- 7 Steel, Manufacture of. 8. unbl. 1855, 1, 10
- 8 Steel, Hardening and tempering of. 8. unbl. '80, 1, 25
- 9 Stengel. Papers. 8. unbl. G. I. Rohstahlfischprozess auf der Lohhuette in Siegen. 25pp. '44, 25; Einfluss der in Steyermark etc. ueblichen Rohstahlfischmethoden auf die Beschaffenheit des Rohstahls. 35pp. '44, 30; Bei Koaks erblasenes Rohstahleisen. 18pp. pl. '44, 25
- 71100 Stoddard & Faraday. Alloys of Steel. 8. unbl. '20, 1, 15
- 1 Stone G.C. Papers, A.I.M. Manganese Determination in Spiegel. '83, 10; Further Determination of Manganese. '84, 10
- 2 Swank J.M. History of Iron Making and Coal Mining in Penna. 125pp. 8. 1878, 1, 100
- 3 " Statistics of the Iron and Steel Production of the U.S. 18pp. 5 maps. pl. 4to. p. 1881, 1, 45
- 4 " Statistics of Am. Iron Trade. 78. 48pp. 8p. '79, 1, 20
- 5 " History of Manufacture of Iron in all Ages. 435pp. 8. 1884, new, 400
- 6 Taylor W.J. Papers, A. I. M. Ore Roasting Furnace. il. '81, 10; Use of High Explosive in the Blast Furnace. etc. '85, 10; Straight or No-Bosh Blast Furnace. '85, 10; Water-cooled Gas Producer. il. '87, 10
- 7 Thomas J. New Gas Generator, Metal Melter and Reversing Puddling Furnace. 21pp. 4 pl. 8. unbl. '72, 1, 30
- 8 Thomson T. Composition of Cast Iron produced by the Cold and the Hot Blast. 8. unbl. '38, 1, 20
- 9 Troilius M. Chem. of Iron. 102pp. il. 8. '86, new, 160
- 71110 " Papers, A. I. M. Tables for Calculating Heat of Furnace Gases. '84, 10; Sulphur Determination in Steel. '84, 10
- 1 Torrey. Welding Iron without Fluxes. il. A.I.M. '78, 10
- 2 Trenton Iron Co. Documents. 32pp. 8. p. '54, 1, 25
- 3 Truran. Iron Manufacture. 226pp. 84 pl. 586 fig. 8, 2, 250
- 4 " Durability of Railroad Iron. 8. unbl. '55, 1, 20
- 5 Tyson P. T. Report on Mineral Lands of Juniata Iron Co., Juniata Co. Pa. 13pp. large map, 8. p. 1858, 1, 25
- 6 Unger. Eisensteinlager im Hoehenzug von Immenrode bis Hildesheim. 69pp. col. map, 8. unbl. '43, 1, 50
- 7 U. S. Revenue Com. Report on Iron & Steel. 54pp. 8. p. '66, 1, 25
- 8 Urbin. Puddling Iron and Steel. 8. new, last ed., 85
- 9 Varley. Choice of Steel, Hardening etc. 8. unbl. 1798, 1, 10
- 71120 Vanuxem. Blue Iron Earth of N.J. P. Ac. J. '21, 35
- 1 Wadsworth M. E. Origin of the Iron Ores of the Marquette Dist., Lake Superior. B. 1880, 15
- 2 Wainwright. Cheaper Blast Furnace Fuel. A.I.M. '88, 10
- 3 Walsh. Irregularities in Blast Furnace Process and Practical Way to avoid them. 28pp. 27 il. A.I.M. '86, 20
- 4 Ward. Wrought Iron direct from Ore. pl. A.I.M. '84, 10
- 5 Waterhouse S. Resources of Mo. & Natural Adaptation of St. Louis to Iron Manufactures. 95pp. 8. p. '69, 1, 30
- 6 Webster. Titanium Determ. in Irons. A. I. M. '86, 10
- 7 Weeks J. D. Papers, 8. I. Iron Ores of James River Valley, Va. st. '81, 10; Trip through the James River Valley. p. '81, 20; Radfield's Patent Manganese Steel. A. I. M. '84, 10; Tests of Manganese Steel. A. I. M. '86, 10
- 8 Wells. Titanium Determ. in Iron Ores. A. I. M. '86, 10
- 9 Wendt A.F. Papers, A. I. M. '84. Concentration of Iron Ores. pl. il., 10; Blast Furnace with Bosh Water Jacket and Iron Top. pl. il., 10
- 71130 West. Am. Foundry Practice. il. new, last ed., 200
- 1 " Moulder's Text Book. il. new, last ed., 200
- 2 Weyrauch J. J. Strength etc. of Dimensions of Structures of Iron & Steel. 221pp. 4 pl. 58 fig. 8. '77, 1, 75
- 3 Whittlesey C. Straitsville, O., as a Point for Making Iron. 8. stitched, 1872, 1, 10
- 4 Whitwell. Iron Smelter's Analysis Book. new, last ed. 150
- 5 Wiley's Am. Iron Trade Manual 1874, ed. by T. Dunlap. 726pp. 6 pl. il. '4to. new, 100
- 6 Wilkie G. Manufacture of Iron in Great Britain. 155pp. 2 pl. 20 il. 8. 1837, 1, 75
- 7 Williams, C.P. Iron Industry of Mo., with reference to Manufact. of Charcoal Iron. 29pp. 8 pl. 8. unbl. '77, 1, 35
- 8 Winslow, Hill, D'Inville & Rand. Lehigh Point Ore Mines, Iron Mines & Limestone Quarries of Cumberland-Lebanon Valley etc. 306pp. 2 maps, pl. 5 il. and Atlas of 12 sheets (some col.) 8. 1887, 1, 100
- 9 Witherbee T. F. Papers, A.I.M. Fluxing Silicious Iron Ores. '77, 15; New Method of taking Blast Furnace Sections. pl. '78, 10; Working of Three Heaths at Cedar Point Furnace. N. Y. 7 il. '79, 15; Scaffolds at the Cedar Point Furnace. 3 il. '80, 15; Use of High Explosives in the Blast Furnace. pl. '81, 10; Removing Obstructions from Blast Furnace Hearths &c. '85, 10
- 71140 Witherow J. P. Papers, A.I.M. Removing Scaffolds in Blast Furnaces. '80, 10; Blast Furnace of Crozer Steel & Iron Co. Roanoke, Va. pl. '83, 15; Clapp-Griffiths Converter—Later Practice and Commercial Results. 23pp. 2 pl. '86, 15
- 1 Wood C. Disintegration and Utilization of Siag. 43pp. 3 pl. 8. unbl. 1873, 1, 30
- 2 Wood & Perot's Portfolio of Designs of Ornamental Iron Work. 174 pl. 591 fig. folio, hmo. 2, 250
- 3 Billin C.W. Cipher Code of Rolled Iron & Steel. Iron & Steel made by each Rolling Mill. 8. 1889, new, 240
- 4 Bramah F. Experiments on the Strength of Cast Iron. 24pp. 3 pl. 45 fig. 29 il. 4to. unbl. '38, 1, 40
- 5 Brix A. F. Cohasions u. Elasticitaets Verhaeltnisse beim Bau der Haengebruecken in Anwendung Komender Eisendraehle, 119pp. 2 pl. 18 fig. 4to. p. G. '87, 3, 50
- 6 Cooper T. Iron and Steel with Valuable Papers by Mushet et al. (357pp. 4 pl.) and Papers on other Scientific Subjects. 506pp. 12 pl. 8. cf. 1813, 2, 75
- 7 Giulio C. I. Experiences sur la Force et l'Elasticite des Fils de Fer. 69pp. 4to. p. '40, F. 3, 35
- 8 Hunt R. W. Discussion of C. D. Dudley's Papers on Steel Rails. 57pp. 3 il. A. I. M. 1879, 25
- 9 Iron & Steel as Structural Materials. Discussion by Eggleston, Welch et al. 44pp. A. I. M. '82, 25
- 71150 Isherwood B. F. Report on Experiments on the Martin Vertical Water Tube Boiler etc. 8. p. '59, 1, 20
- 1 Fryer. Architectural Iron Work. il. 8. new, 1. ed., 280
- 2 Holley & Thurston. Results of Tests and Analyses of Steels. 110pp. 121 pl. 8. unbl. 1881, 1, 25
- 3 Lord N.W. Iron Manufactures of Ohio. 117pp. 3 pl. 24 fig. 8. unbl. 1884, new, 101
- 4 Morrell D. J. Report on the Iron and Steel Exhibits at Paris. 1878. 113pp. pl. 8. unbl. 1880, new, 75
- 5 Mouche. Manufact. of Iron & Steel Wire. 8. unbl. '12, 1, 20
- 6 Orton E. Iron Ores of Ohio. 66pp. 8. unbl. '84, 1, 75
- 7 Pascal Iron Works, Philadelphia, Catalogue cf. 25pp. 87 pl. 4to. 1861, 2, 50
- 8 Pencoyd Iron Co's. Pocketbook. mo. '87, new, 200
- 9 Percy J. Iron Ores of the North and North Midland Cos. of England. 97pp. il. 8. p. '56, 1, 75, or 3, 30
- 71160 Percy. Report of Chief of Ordnance on Tests of Iron and Steel etc. 670pp. 54 pl. many hundred il. 8. st. '78, 1, 100
- 1 Report of Com. of Franklin Inst. on Strength of Materials for Steam Boilers. 251pp. pl. 8. p. '87, 1, 35
- 2 Sandberg C.P. Manufacture and Wear of Rails. 91pp. 3 pl. 13 fig. 7 il. 8. p. 1869, 1, 50
- 3 " Rail Specifications and Rail Inspections in Europe. 57pp. 5 pl. A.I.M. 1880, 35
- 4 Smith D. Tests of Quality of Steels for Tools. 208pp. 94 pl. 8. unbl. 1881, 1, 35
- 5 Smith & Laidley. Report on Strength of Iron Girders and Columns. 65pp. 3 pl. 35 il. 8. unbl. '81, 1, 25
- 6 Thompson. Salt in Wire Drawing. A. I. M. '81, 15
- 7 Thurston R.H. Iron & Steel. 8. new, last ed., 320

Papers from Am. Jour. of Science and Arts.

- 71170 Berthier. Analysis of Fer Titane. Baltimore. '33, 10
- 1 Bessemer H. Manufacture of Cast Steel. '68, 10
- 2 Blake W.P. Iron Regions of Arizona. 1865, 10
- 3 Booth & Lea. Anal. of Cuba Chromic Iron Ore. '40, 15
- 4 Brush & Rodman. Native Hydrates of Iron. '67, 10
- 5 Clark. Hot Blast in the Manufact. of Cast Iron. '37, 10
- 6 Clarke O.L. Manufacture of Steel. 1829, 15
- 7 Corbin J.H.H. Chromium & Iron Compounds. '50, 10
- 8 Caste & Perdonnet. Steel Fabrication, Sheffield. il. '31, 10
- 9 Dana J. D. Rammelsberg's Results with regard to Composition of Titanic Iron Ore. 1859, 10
- 71180 Eggertz. Determining Carbon in Iron. '69, 10
- 1 Gibbs. Siemens Regenerative Gas Furnace. '65, 10
- 2 Haldeman S. S. Construction of Blast-furnaces for Smelting Iron with Anthracite. 3 il. '48, 10
- 3 Hall F. Papers. Ores of Iron, etc. in Vt. '21, 15; Iron Mines & Iron Manufact. in Vt. '22, 15; Tour in France, Italy and Elba, with notice of its Iron Mines. '37, 15
- 4 Hunt T.S. Octahedral Oligist Iron. 1852, 10
- 5 Janoyer. Influence of Sulphur on Iron. 1857, 15
- 6 Johnson. Analyses of Anthracite & Iron Ore. '40, 10
- 7 Kendall T. Cutting Steel by Soft Iron. 1826, 10
- 8 Kimball J.P. Iron Ores of Marquette, Mich. '65, 10
- 9 Locke J. Coppers Mines, Stratford, Vt. 1821, 15
- 71190 Manross N.S. Coal & Iron, Guero, Mex. 1865, 10
- 1 Percy & Miller. Crystalline Slags produced in Smelting & Manufacturing of Iron. 1848, 10
- 2 Riley E. Titanium in Pig Iron and Use of Titaniferous Minerals in Manufact. of Iron & Steel. '64, 10
- 3 Shepard C. U. Papers. Native iron (?) slightly arseniuretted. '28, 35; Crystallized native Terrestrial Iron, etc. '29, 15; Mine of Spathe Iron, New Milford & Iron Works, Salisbury, Conn. 16pp. il. '31, 10; Analysis of Am. Spathe Iron etc. 1853, 10
- 4 Silliman B. Cutting of Steel by Soft Iron. '24, 10
- 5 Smith J. L. Operations of the Blast Furnace in the Manufacture of Iron. 15pp. il. 1846, 15
- 6 Whitney J.D. Iron Ores in the Azoe System. '56, 15

GOLD AND SILVER.

(See also Books and Papers under Mineralogy, Mining, Local Mineralogy, etc.)

- 71440 Aaron. Leaching Gold & Silver Ores. The Plattner & Kiss Processes. il. 8. new, last ed., 2.80
 1 ** Testing and Working Silver Ores. 76, new, 2.00
 2 Abercrombie Gold Mining Co., Quebec. Report by J. A. Phillips & Kent. 18pp. map, 8. stitched, '63, 1, .35
 3 Almy. Ontario Mine, Park City, Utah. A. I. M. '87, .10
 4 Am. Flag Gold Min. Co. Report etc. 24pp. 8. st. '64, 1, .25
 5 American & Mexican Silver Mining Co's. Mines, Chihuahua, Mexico. Report by S. P. Leeds. 8. p. 1862, 1, .25
 6 ** Articles of Assoc. & By-Laws, etc. 16pp. 8. p. '62, 1, .10
 7 Anderson A. D. The Silver Country or the Great Southwest. 221pp. col. map, 1877, 1, 1.00
 8 Ansted. Gold Seeker's Manual. 96pp. p. 1, 1.00
 9 Attwood. Milling of Gold Quartz. il. 8. st. '81, 1, .10
 71450 Austin W. L. Papers, A. I. M. Silver Mining in Arizona. 16pp. il. '82, .15; Smelting Notes from Chihuahua. '83, .10; Mex. Cupellation Hearth. il. '84, .10; Matting Dry Auriferous Silver Ores. '87, .10
 1 Barstow W. Sulphurets: What they are, How Concentrated, Assayed & Worked. 114pp. 1867, 1, .50; or, 3, .25
 2 Bassick Mine, Colorado. Report on, by H. Cummins. 24pp. 4. pl. 1879, 1, .50
 3 Bear River Tunnel Co. Report on Property of, by H. De Groot. 40pp. 1. 8. p. 1881, 1, .20
 4 Becker G. F. Geol. of Comstock Lode and Washoe District. Vol. Text. 437pp. 7 col. pl. (1 of microscopic sect.) 33 il. 4to. and folio Atlas of 21 col. sheets, '82, 1, 7.50; or, Text, cloth & Atlas, unbound, 5.00; or, Text alone, sh. 1, 3.50; or p. 1, 2.50
 5 ** Summary of above. 38pp. 2 col. pl. il. 8. unbound, '82, 1, .25
 6 Bellefeuille. Gold Mining in Lower Can. '85, 3, .20
 7 Big Bend Hydraulic Min. Co. map, 8. p. '83, 1, .10
 8 Blake W. P. Report on Precious Metals. Statistics of Production etc. 376pp. pl. 8. p. 1869, 1, .25; or, 2, .15
 9 ** Silver King Mine, Arizona. 48pp. 3 pl. il. 8. p. '83, 1, .15
 71460 ** Forms of Gold in Nature. 25pp. 55 il. 8. st. '85, 1, .25
 1 ** Papers, A. I. M. Geol. & Veins of Tombstone, Arizona. il. '81, .10; Rainbow Lode, Butte City, Montana. '87, .15; Silver Min. & Milling, Butte, Montana. '87, .10
 2 ** Papers, 8. unbound. 1. Extent of Gold Regions. of Cal. and Oregon. '85, .15; Gold Placers of a Part of Lumpkin Co. Ga. 20pp. '58, .20
 3 ** & Jackson. Gold Placers of Dahlonega, Ga. 64pp. 3 maps, il. 8. stitched, 1859, 1, 1.00
 4 ** F. C. Papers, A. I. M. '81. Test Support for Engl. Cupellation Furnace. .10; Silver Bullion Assaying. il. '81, .10
 5 Blossom. Assay of Gold & Silver. 36pp. p. '79, 2, .25
 6 Bobtail Gold Mining Co. of Col. 8. p. 1, .20
 7 Bodie Bluff Mines, Cal., with Penn and Pencil by J. R. Browne. 15pp. 4 pl. 8. p. 1855, 1, .35
 8 Bolanos Mining Co. Proceedings of the Annual and Special General Court of Proprietors, and Reports 1827 to '38. 354pp. 4 fddg. pl. folio, hft. 1, 5.00
 9 Bousingault. Native argentiferous Gold. 8. unbound, '27, 1, .10
 71470 Bowie. Hydraulic Mining in Cal. '85, new, 4.00
 1 ** Gold Mill Construction. 13pp. pl. il. A. I. M. '81, .25
 2 Brittenstene. Silver Mining Co. Co. Statement and Report of G. Daly. 18pp. 2 sect. 8. p. 1880, 1, .25
 3 Buffum. Six Months in Cal. Gold Mines. 170pp. '50, 1, .25
 4 Cal. State Mining Bureau Reports, see Local Mineralogy.
 5 California & New Mex. Message of Presdt. and Documents, 976pp. 7 maps, 8. hfn. '50, 2 (Mines etc.), 1.25
 6 Cal. Water & Mining Co. Reports by Raymond, Hutchins et al. 54pp. col. map, col. pl. 8. p. '80, 2, .35
 7 Calvert J. Gold Rocks of Great Britain & Ireland; with a Treatise on the Geology of Gold. 356pp. 8. '53, 1, 2.50
 8 Chevalier M. Probable Fall in the Value of Gold, trans. by R. Cobden. 211pp. 8. 1859, 1, .50
 9 Chapman E. J. Remarkable Belt of Auriferous Country in Marmora Township, Ontario. il. 8. unbound, '72, 1, .20
 71480 Chance. Auriferous Gravels of N. C. A. P. 1881. .10
 1 Chancellorsville Gold Ore Reduct. Co. 8. unbound, '57, 1, .15
 2 Chemical Gold and Silver Ore Reduct. Co. Report by Torrey, Silliman, Ayer et al. 16pp. 8. p. '65, 1, .25
 3 Christy S. B. Losses in Roasting Gold Ores and Volatility of Gold. 43pp. A. I. M. 1888, .20
 4 Church J. A. Comstock Lode: Its Formation and History. 231pp. 6 col. pl. 13 il. 4to. 1879, new, 4.00
 5 ** Papers, A. I. M. Accidents in Comstock Mines. '79, .10; Improvements in Concentration & Amalgamation. il. '79, .10; Heat of Comstock Lode. '80, .10; Concentration & Smelting, Tombstone, Arizona, 1887, .20
 6 ** Report upon Comstock Lode. 23pp. W. '78, .15
 7 Clarke W. B. Progress of Gold Discovery in Australasia from 1860 to '71. 23pp. 8. bds. n. d. 1, .25
 8 Clemens J. H. Experimental Working of Silver Ores by the Leaching Process. 17pp. A. I. M. '83, .20
 9 Colorado Co. Consolidated, Statement & Resources.

- Report. by F. V. Hayden et al. 48pp. 3 pl. 8. p. '78, 2, .50
 71490 Comstock J. L. Hist. of Precious Metals: Testing their Purity: Min. Wealth of Cal. etc. 222pp. il. '49, 1, 1.00
 1 Cornish T. Our Gold Supply. 23pp. 8. p. 1887, 1, .20
 2 Cornwallis K. The New El Dorado, or British Columbia. 423pp. col. map, col. pl. 1858, 1, .75
 3 Cronisei F. Natural Wealth of Cal. Mineral Resources. Gold Fields etc. 712pp. 15 pl. 8. '63, 1, 1.50
 4 Curtis J. S. Silver-Lead Deposits of Eureka, Nevada. 212pp. 16 col. pl. 10 il. 4to. sh. 1884, 1, 1.00
 5 Dagget E. Russell Process in its Practical Application & Economical Results. 134pp. 2 pl. il. A. I. M. '88, .35
 6 Dawson G. M. Phys. & Geol. Features of South. Brit. Columbia (Gold Fields etc.). 187pp. 6 pl. il. 8. unbound, '78, 1, .75
 7 Day Silver Min. Co., Nev. Report '82. 8. stitched, 1, .15
 8 Defiance Silver Mining Co., Col. Report on Geol. and Min. of Property by Ryerson, etc. 34pp. pl. 8. p. '69, 1, .15
 9 Del Rio A. Silver Ores reduced by the Method of Becquerel. A. P. Trans. 1884, .15
 71500 ** & Millington. Report to Penna. Geol. Soc. on Rappahannock Gold Mines, Va. 20pp. il. 8. unbound, '34, 1, .30
 1 Devereux W. B. Occurrence of Gold in Potsdam Formation, Black Hills, Dakota. il. A. I. M. '82, .15
 2 Dickson J. Gold Region of U. S. 17pp. 8. unbound, '34, 1, .20
 3 Dubois W. E. Papers, A. P. Specimens of Silver Ore. '69, .10; Lake Superior Silver Mines. '70, .10
 4 ** Prevention of Fraud upon Gold Coins. 8. st. '74, 1, .10
 5 Durango Silver Mines, Mex. Property and Reports by F. Weidner et al. 63pp. 5 maps. 8. p. '65, 1, .75
 6 Eissler. Metallurgy of Gold. 188pp. 90 il. new, led., 2.40
 7 Eggleston T. Metallurgy of Silver. pls. il. 8. new, led. 6.00
 8 ** Papers, A. I. M. etc. Pan Amalgamation of Silver Ores in Nevada and Col. 28pp. 2 pl. 9 fig. 49 il. '79, .25; Cal. Stamp Mills. 15pp. 23 il. '80, .15; Zinc Desilverization. 32pp. 11 pl. 53 fig. '80, .35; Treatment of Gold Quartz in Cal. 16pp. 2 pl. 20 il. '81, .15; Formation of Gold Nuggets & Placer Deposits. '81, .10; Cause of Rustiness and some Losses in Working Gold. '81, .10; Progress of Metallurgy of Gold & Silver in U. S. 46pp. '82, .15; Leaching Gold and Silver Ores in the West. 24pp. '83, .15; Researches on Amalgamation of Gold and Silver. '83, .10; Patio and Cazo Processes for Amalgamating Silver Ores. 6 il. '84, .30; Russell's Leaching Process. '84, .10; Parting Gold and Silver in U. S. Assay Office, N. Y. 23pp. '85, .15; Parting Gold and Silver by means of Iron at Lautenthal. 2 pl. 15 fig. '85, .10; Parting Gold and Silver in Cal. 3 pl. '85, .10; Treatment of Roasted Pyrites for Extraction of Gold & Silver. 21pp. '85, .15; Working Placer Deposits in the U. S. 31pp. '86, .15; Parting Process in U. S. Mint, Philada. 30pp. '86, .15
 9 Elgin Gold Min. Co., Can. Prospectus. 20pp. 8. st. '64, 1, .20
 71510 Ellet. Hydraulic Mining in Cal. & N. C. 8. unbound, '58, 1, .15
 1 Empire Gold Min. Co. Cal. 23pp. 8. p. 1879, 1, .15
 2 Empire & Silver State Min. Co. Report. 20pp. 8. p. '66, 1, .20
 3 Emmons & Becker. Statistics and Technology of the Precious Metals. 556pp. il. 4to. 1885, new, 1.00
 4 Fabian B. Australia; Guide to the Gold Regions. 112pp. map, 8. p. 1852, 2, 1.00
 5 Frazer P. Papers, A. I. M. "Centennial" and "Lotta" Gold Properties. Coahuila, Mex. il., .10; Whopper Lode, Gunnison Co. Col. il. '80, .15
 6 Frazer River Gold Mines. 8. unbound. 1858, 1, .20
 7 Gatling Gold and Silver Mining Co., Can. Reports by Richard, Chapman et al. 24pp. 8. p. '73, 1, .25
 8 Gee. Goldsmith's Handbook. 259pp. last ed. new, 1.40
 9 ** Silver Smith's Handbook. 221pp. il. new, last ed., 1.40
 71520 Genth F. A. Rhodium Gold. A. P. 1870, .10
 1 Gilpin W. Central Gold Region. Grain, Pastoral and Gold Region of N. A. 194pp. 6 col. pl. 8. '60, 1, .75; or 2, .50
 2 ** E. Nova Scotia Gold Mines. 15pp. map, A. I. M. '86, .15
 3 Gold Coinage. 8. unbound. 1872, 1, .25
 4 Gold, its Discovery etc. in the U. S. 8. unbound. 1864, 1, .20
 5 Gold Ores. Treatment of. 8. unbound. 1864, 1, .15
 6 Gold Panic. Investigation of Causes, Report of Com. on Banking & Currency. 487pp. 8. 7/10, 1, .25; or hmo., .75
 7 Gold and Silver Tables showing Value per ounce try at different Fineness. 54pp. 4to. p. '67, 2, .25
 8 Gold, Article on. 14pp. 11 il. 4to. stitched, n. d. 1, .15
 9 Gold Min. Co. of Col. Prospectus. 2 maps. 8. st. '63, 1, .20
 71530 ** Same. Reports, each about 15pp. 8. stitched, 1, .15
 1 Gold and Gold Mining. 8. unbound. 1870, 1, .20
 2 Gold & Silver Mines & Mining in Cal. & Nev. & Prospectus of Globe Mining Co. 31pp. map, pl. 8. p. '68, 2, .25
 3 Gold, Silver etc. of Russia. 8. unbound. 1832, 1, .15
 4 Grand Trunk Gold Mining Co., Can. Prospectus and Reports by Hall, Hodge et al. 19pp. 8. st. '64, 1, .15
 5 Granite Mt. Min. Co. Reports, each 16pp. map. 8. p. 1, .25
 6 Graphic Cons. Mill & Min. Co. Cal. map. 8. p. 1, .25
 7 Greeley's Views of Nevada Gold Mines. 8. unbound. '64, 1, .10
 8 Guernbel C. W. Beitrage zur Geologie der Goldkueste in Africa. 26pp. 8. unbound. 1882, G. 1, .30

- 9 Haquet Prof. Krystallisiertes Golderz etc. 19pp. 11 fig. 4to. unob. 1796, G. 1. .65
- 71540 Hattie Silver Min. Co. Report, etc. 28pp. 8 p. '66, 1. 25
- 1 Heatherington A. Practical Guide to the Gold Fields of Nova Scotia. 177pp. col. sect. 1868, 1. .75
- 2 Heintzelman Mine, Arizona. 8 p. 1863, 1. .15
- 3 Heinhacker R. Vorkommen des Goldes auf secundären Lagerstätten. 43pp. 8. unob. '79, G. 1. .30
- 4 Helper H. R. The Land of Gold. 300pp. 1855, 2. .50
- 5 Hildebrandt, Convers. of Silver into Gold. 8. unob. 1799, 1. 15
- 6 Hitchins. Silver in Herland Copper Mine. 8. unob. '01, 1. 10
- 7 Hodges A. D. Process at the Comstock for Refining Copper Bullion. 28pp. 9 il. A. I. M. 1880. .15
- 8 Hoffmann. Trough-Lixivation. 31pp. 2 il. A. I. M. '88, 1. 10
- 9 Hollister. Gold & Silver Mining, Utah. 16pp. A. I. M. '87, 1. 10
- 71550 Howe H. M. Metallurgy of Argentiferous Copper Compounds. 61pp. il. 8. unob. 1884, 1. .25
- 1 Hunt T. S. Canada Gold Region. 72pp. 8. p. '66, 1. .50
- 2 Hutton & Ulrich. Report on Geology and Gold Fields of Otago. 249pp. geol. map, 10 pl. il. 8. 1875, 1. .75
- 3 Idaho Gold Mines. 8. unob. 1864, 1. .15
- 4 Idaho Mining and Irrigation Co. Report by A. D. Foote. 39pp. 3 maps, 5 pl. 4to. p. 1884, 1. .50
- 5 Ingham G. T. Digging Gold among the Rockies. 508pp. 32 pl. 1880, new. 1.00
- 6 International Monetary Conference. Proceedings, Exhibits, Correspondence etc. 918pp. pl. humor. '79, 1. 75
- 7 International Silver Min. Co., Pah-Ranagat Distr. Nev. Articles on Mining etc. 46pp. map, 8. p. '66, 1. .25
- 8 Jackson C. T. Report upon Property of Abercrombie Gold Min. Co. Can. S. stitched. 1863, 1. .25
- 9 " Papers. 8. unob. 1. Extracting Pure Gold from Alloys, etc. '49, 15; Moore's Gold Mines. Ga. '54. .10
- 71560 " A. W. Silver in Sedimentary Rocks. 8. unob. '81, 1. 10
- 1 Jacob W. Papers. 8. unob. 1. Consumption of Gold and Silver in Britain, 1810 to '29, 19pp. '32, 20; Earliest Knowledge of Gold and Silver. '32. .20
- 2 Jameson R. G. Australia and her Gold Regions, 159pp. col. map, 1852, 2. .50
- 3 Johnson T. T. Sights in the Cal. Gold Regions and Scenes by the Way. 290pp. 1849, 3. 1.00
- 4 Johnson. Gold Formations of Md. Va. & N. C. A. I. M. '51, 1. 10
- 5 Journal of Gold Mining Operations, Jan. '54 to June '56. 268pp. 8. unob. 1. .75
- 6 Journal of Silver and Lead Mining Operations, Jan. '54 to June '56. 85pp. 8. unob. 1. .25
- 7 Juan & Ulloa. Voyage to South America. Account of Gold and Silver Mines etc. 2 vols. 950pp. 7 pl. 8. cf. 1760, 1. rare and valuable. 3.50
- 8 Kardorf-Wabnitz. Gold Standard. 58pp. 8. p. '80, 1. .25
- 9 Karsten. Harzer Buttermilcherz. 4to. unob. 1796, 1. .35
- 71570 Kent E. N. Instructions for Collecting, Testing & Assaying Gold. 39pp. 30 il. stitched, '48, 3. .50
- 1 Kessler C. Report on Gran Probre Silver Mine in Venezuela, with Analysis of Ores. 8. unob. 1854, 1. .15
- 2 Kimball J. P. Cretaceous Age of Silver Deposits in Chihuahua, Mex. A. A. S. 1870. .15
- 3 Kinahan C. H. The Gold and Placer Mines of Wicklow. il. 8. unob. 1878, 1. .25
- 4 King C. Production of Precious Metals in the U. S. 69pp. 6 col. pl. 4to. unob. 1882, 1. .30
- 5 " Statistics of the Production of the Precious Metals in the U. S. 6 col. pl. 4to. p. 1881, 1. .25
- 6 Klapproth. Assaying of Coin. 8. unob. 1803, 1. .15
- 7 Knickerbocker Gold Min. Co., Col. 35pp. 8. p. '65, 1. .50
- 8 Koenig G. A. Silver Ore from Col. P. Ac. '72. .10
- 9 Koscharoff M. de. Large Mass of Native Gold found in the Oural Mountains. 8. unob. 1843, 1. .15
- 71580 Kuestel G. Roasting of Gold & Silver Ores, & Extraction without Quicksilver. 145pp. 16 il. 8. '80, new, 2.80
- 1 Kunz G. F. Papers. 8. p. '87, 1. Gold Ornaments from U. S. of Colombia, pl. 3 il. 20; Gold & Silver Ornaments from Mounds of Fla. 9 il. .10
- 2 La Crosse Gold Min. Co., Col. 31pp. 2 pl. 8. p. '64, 1. .20
- 3 Lange. Entgoldung der Reichensteiner Arsenikkiesabbaende durch Chlor. 34pp. 8. unob. '51, G. 1. .25
- 4 Leeds S. P. Papers. 8. unob. 1. Gold Regions of N. C. & S. C. 21pp. il. '54, 20; Causes of Failures in Working Gold Mines. 17pp. 1858. .20
- 5 Leggett T. H. Native Silver Ores and their Treatment at Batopilas. 8. unob. 1886, 1. .15
- 6 Levey. Gold Mining on the Saskatchewan. il. 8. unob. 1. 15
- 7 Life in California, during a Residence of several Years, by an American. 353pp. 9 pl. N. Y. 1846, 2. 1.00
- 8 Lingren W. Silver Mines of Calico. 18pp. map, 7 il. A. 1. M. '87. .15
- 9 Lindsley T. Suggestions upon Purchase and Sale of Lode Mining Property in Cal. 24pp. 8. p. '64, 1. .10
- 71590 Lock. Gold, its Occurrence and Extraction. Geographical and Geological Distribution and Mineralog. Character of Gold-bearing Rocks. il. 4to. '88, new, 16.00
- 1 Lord Cons. Gold & Silver Min. Co. 20pp. 8. p. '77, 1. .15
- 2 Lord E. Comstock Mining and Miners. 465pp. 3 maps (1 col.) 4to. cf. 1883, new. 1.50
- 3 Lower Canada Gold Co. 26pp. col. pl. 8. st. '63, 1. .30
- 4 Lyon & Gwynn. Hyko Silver Min. Co. Pah-Ranagat Distr. Nev. 49pp. 2 maps, 8. p. 1867, 2. .25
- 5 McDermott W. Combined Amalgamation and Concentration of Silver Ores. A. I. M. 1885. .15
- 6 Macfarlane T. Silver Islet. 28pp. pl. il. A. I. M. '79. .25
- 7 Mammoth Gold Min. Co., Col. Prospectus. 4to. st. 1. 10
- 8 Mariposa Gold Co. Cal. Reports by Garnett & Wakelee, Allyn, and Adelberg. 81pp. map, 8. 1863, 1. .60
- 9 Marsh O. C. Gold of Nova Scotia. 8. p. or unob. '61, 1. 10
- 71600 Maynard. Gold Specimen from Cal. A. I. M. '80. 15
- 1 Mell P. H. Auriferous Slate Deposit of the Southern Mining Region. A. I. M. 1881. .15
- 2 Mex. Syndicate 1830 to 1882. Hist. & Reports by C. H. Emerson, Schuchard et al. 54pp. 2 maps, 4to. p. 2. 75
- 3 Michel A. Report on the Gold Regions of Lower Canada. 31pp. 8. unob. 1866, 1. .40
- 4 Milton Min. & Water Co. Report. 16pp. 4to. p. '80, 1. .20
- 5 Mint of the U. S. Description of. 16pp. il. 8. '78, 1. .15
- 6 " Reports of the Director on Production of Precious Metals in U. S. (These reports contain many valuable papers by Egleston, Blake et al.) 8. 1. 1880. 43pp. 3 pl. '81, 25; '81. 765pp. '82, 25; '82. 873pp. '83, 25; '83. 858pp. '84, 25; '84. 644pp. il. '85, 50; '85. 317pp. '86, 25; '86. 343pp. '87. .25
- 7 " Reports of the Director (in Finance Reports) 1849 to '72. 24 vol. 8. 1. 5.00; or, Odd Vol. each about 450pp., 25; or, Reports separate, cloth or p. 1, each. .25 to 50
- 8 " Laws relating to the Mint. 103pp. 8. sh. '67, 1. .50
- 9 " Rules etc. of Annual Assay. 31pp. 8. st. '57, 1. .50
- 71610 " Visit to the Cabinet of. 92pp. il. 1876, 1. .35
- 1 Mowry S. Arizona and Sonora. Geography, Resources etc. of Silver Region of N. A. 251pp. pl. '64, 2. .75
- 2 Munroe H. S. Report on the Gold Fields of Yesso, Japan. 80pp. 8. p. 1875, 1. .35
- 3 Murchinson. Gold Produce of Siberia. 8. unob. '46, 1. .15
- 4 Music Mt. Gold Min. Co. Prospectus. 8. p. '84, 1. .15
- 5 Nevada Silver Convention. Proceed. 45pp. 8. p. '85, 1. .20
- 6 Nevada Silver Min. Co. Churchill Co. Nev. Report by C. P. Williams etc. 27pp. il. 8. p. 1865, 1. .20
- 7 Nevada Silver Mines. 76pp. 2 maps, 8. p. 1864, 1. .15
- 8 Nevada, Worthless Silver Mines of. 8. unob. '65, 1. .15
- 9 Newberry J. S. Report on Sierra Rica and San Carlos Mines, Chihuahua, Mex. 15pp. 8. p. '83, 1. .20
- 71620 " Genesis and Distribution of Gold. 8. p. '81, 1. .25
- 1 New Phenix Gold Min. Co. N. C. Prospectus. 8. p. '56, 2. 15
- 2 Newton. Ancient Mints and Coining. 8. unob. '68, 1. .15
- 3 New York & Cal. Min. Co. Prospectus etc. 8. p. '67, 1. 15
- 4 New York & El Dorado Min. Co., Reports & Letters by Mitchell, Bohlen et al. 31pp. map, 3 pl. 8. p. '65, 1. .35
- 5 N. Y. & Silver Peak Min. Co. 16pp. map, 8. p. '65, 1. .30
- 6 North Bell Isle Min. Co. Nev. Reports. 8. p. 1. each. 15
- 7 N. Bloomfield Gravel Min. Co., Cal. 23pp. 8. p. '80, 1. 25
- 8 N. Clear Creek Gold & Min. Co., Col. 17pp. 8. p. '64, 1. 20
- 9 Oneida Montana Gold & Silver Min. Co. 8. p. 1. .25
- 71630 Ontario Silver Min. Co. Reports, each about 20pp. 4 maps, 4to. p. 1. .25
- 1 Oregon & Cal. Account of Gold Regions. Methods of Testing Gold etc. 76pp. 12 il. col. map, rn. '49, 2. .50
- 2 Oro Mining, Ditch & Flue Co. Report. 2 maps, 8. p. 1. 25
- 3 Ott A. Gold in Metallic Sulphides. 8. st. '68, 1. .15
- 4 Outerbridge A. E. Experiments on Alloys of Silver with embrittling Metals. 8. p. 1879, 1. .20
- 5 Partz A. Gold-bearing Belts of the Atlantic States. 19pp. map, il. 8. unob. 1854, 1. .35
- 6 Patterson L. B. Twelve Years in the Mines of Cal; Gen. View of the Gold Region. 108pp. 1862, 2. .50
- 7 Pearsall H. D. Improved System of Water Supply for Hydraulic Mining. il. A. I. M. '88. .15
- 8 Pelletier. Facts relative to Gold. 8. unob. 1820, 1. .15
- 9 Percy. Silver & Gold. Part 1. il. 8. 1880, new. 9.60
- 71640 Phillips J. A. Gold in California. 8. unob. '68, 1. .35
- 1 Pierce W. I. Papers. A. I. M. Cost of Mining & Milling Gold Ores in Nova Scotia. 3 il. '85, 10; La Plata and Libano Mines, Tolima, Colombia. S. A. il. '88. .10
- 2 Plaitner's Test for Gold Ores. 8. unob. 1856, 1. .15
- 3 Prospectus for Organization of a Co. for Min. & Smelting Silver Ores at Thunder Bay. 8. p. 71. .20
- 4 Promethean Tunnel in Nevada. 8. p. n. d. 1. .15
- 5 Randall P. M. Quartz Operator's Handbook. 175pp. 16 il. 1871, 1. pub. at \$2.00. .50
- 6 Randolph. New Mill, Batopilas, Mex. 2 pl. A. I. M. '82, 25
- 7 Rappahannock Gold Min. Co. Prospectus. 8. p. '79, 1. 15
- 8 Raymond. Improved Bruckner Cylinders. pl. A. I. M. '85, 10
- 9 Reciprocity Mining Co., Canada, Statement, Report by H. Wurtz, etc. 34pp. 8. p. 1864, 1. .20
- 71650 Red Hill Hydraulic Gold Mines. 21pp. pl. 8. p. '82, 1. 20
- 1 Report from the Sec'y of the Treasury respecting the relative Value of Gold & Silver. 118pp. 8. st. '30, 1. 1.25
- 2 Richards J. Stamping Machinery. 8. unob. '81, 1. .14

- 3 Rocks that afford Gold Dust or Gold Sand met with in Rivers. 8. unib. 1828, 1. .20
- 4 Rolker. Banded Struc. in Gold Vein. il. A.I.M. '85, 1. .10
- 5 Rothwell R. P. Papers. A. I. M. Cost of Milling Silver Ores in Utah & Nevada. pl. 79, 25; Silver Sandstone District of Utah. 4 il. '80, 15; Gold-bearing Mispickel of Marmora, Can. map, '81, 20; Treatment of Gold-bearing Arsenical Rock, Deloro, Can. '82, 10
- 6 Rowan Co. N. C. Reduction Co. Prospectus, Reports by Prof. Endlich & Boynton etc. 22pp. 8. p. '80, 1. .20
- 7 Ruehl K. Californien, dessen Industrie, Minen etc. 291pp. 2 col. maps, 8. hmo. 1867, G. 1. 1.00
- 8 Sacra Familia Mines, Corralillo, Costa Rica. Reports & Documents relating to. 88pp. col. map, 8. p. '65, 1. .75
- 9 San Pedro & Canon del Agua Grants, New Mex. Compilation of Facts relating to. 38pp. map, 8. s. '67, 3. .35
- 10 Savage Min. Co. Report '67. 30pp. col. map, 8. p. 1. .35
- 11 Schaeffer. Gold in Williamson Co. Tex. A.I.M. '83, 1. .10
- 12 Schoolcraft. Native Silver from Mich. N.Y. Lye. '24, 10
- 13 Shaler. Silver Question geographically considered. 8. st. 78, 1. .10
- 14 Sherwood Silver Min. Co. Nev. 8. p. 1868, 1. .10
- 15 Silliman B. Report on United Reese River Silver Mining Co. Nev. 29pp. 8. p. 1865, 1. .35
- 16 " Report on Gold Property of New York & Nova Scotia Gold Mining Co. 56pp. map, 8. p. 1864, 1. .30
- 17 " Mechanical & Chem. Treatment of Gold. 8. unib. '64, 1. .15
- 18 " & Marvinne. Telluride Ores of Red Cloud & Gold Spring Mines, Gold Hill, Col. pl. il. H. '74. .10
- 19 Silver Islet Min. Co. Prospectus. 8. p. 1871, 1. .15
- 20 Silver King Min. Co. Arizona. 17pp. 8. p. '87, 1. .20
- 21 Silver Mines of Nevada. 8. unib. 1865, 1. .10
- 22 Skidmore W. A. Papers. 8. unib. 1. Product of Precious Metals in Cal. & Improved Mining & Milling Machinery. 45pp. '81, 20; Condition of Min. Industry in Cal. '83 and Product of Precious Metals. 27pp. '84, 20
- 23 Smith. La Paz, Lower Cal. Mines. 8. unib. '65, 1. .15
- 24 " J. Y. Import Duties & Value of Gold. 8. unib. '74, 1. .15
- 25 Smith & Parmlee Gold Co. Col. Report. 8. p. '86, 1. .15
- 26 " Same, by Am. Bureau of Mines. pl. 4to. p. '66, 3. .20
- 27 Snowden. A. L. The Silver Question. 8. p. 1880, 2. .15
- 28 Sonora Exploring & Min. Co., Arizona. Report on Resources etc. by F. Brunkow. 47pp. col. map, 8. p. '59, 2. .25
- 29 " Same. Report on Possessions & Prospects of. 24pp. 2 maps, 3 pl. il. 8. p. '57, 2; Assays by Booth & Torrey. 30
- 30 " Same. Annual Reports, each about 16pp. 8. p. 1. .15
- 31 Soulie E. Les Gisements de Metaux Precieux des Etats du Pacifique (Etats Unis) 80pp. map, 8. p. F. '77, 1. .25
- 32 So. Park Gold Min. & Exploring Co. Col. 8. p. '66, 1. .25
- 33 Spilsbury E. G. Papers. A.I.M. Gold Mines in S. C. '83, 10; Treatment of Southern Gold Ores, etc. '87, 10; Chlorination of Gold-bearing Sulphides. '87. .10
- 34 Sprague J. T. Memoir upon Stephenson's Silver Mine. Fort Fillmore, N. M. 40pp. map, 2 pl. (1 col.) 8. p. '58, 1. .50
- 35 Stansbury. Reduction of Auriferous Ores. 8. unib. '54, 1. .15
- 36 Stetefeldt C. A. Papers. A. I. M. Amalgamation of Gold Ores etc. '85, 10; Effect of Caustic Lime in Lixivation of Silver Ores. '86, 10; Russell's Improved Process for Lixivation of Silver Ores. 34pp. il. '86, 20
- 37 Stirling P. J. Australian & Californian Gold Discoveries, and probable Consequences. 279pp. pl. 1853, 2. .75
- 38 Stephenson Silver Min. Co., N. M. Report on by W. H. Rittler. (See also No. 71684) 22pp. 8. st. '60, 1. .25
- 39 Stone R. C. Gold & Silver Mines of Am. 40pp. '78, 1. .15
- 40 Sulphurets. Treatment of. 19pp. 8. p. 1869, 1. .25
- 41 Sutton G. Gold-bearing Drift of Indiana. (Abstract.) 8. p. '82, 1. .20; or unib. A. A. S., 15
- 42 Sutor A. Min. Resources of U. S. Rational Syst. of Mining with special reference to the Comstock Lode & Sutor Tunnel. 232pp. 2 col. maps, pl. 4to. '68, 2. .75
- 43 " Closing Argument on Bill before Congress to aid the Sutor Tunnel. 96pp. 8. p. 1872, 1. .30
- 44 " Minority Report Reviewed. 24pp. 8. p. 1873, 1. .25
- 45 Sutor Tunnel. Report of Com. & Evidence before Com. of Mines & Mining. 450pp. 13 pl. & maps (some col.), 8. gilt. 72, 1. 1.25; or, 1042pp. 8. 1872, 75
- 46 Taylor R. C. Reports on Washington Silver Mine. Davidson Co. N. C. 40pp. 4 col. pl. 8. p. 1845, 1. .35
- 47 Tikup & Geneva Mining Co. Nevada. Report by J. E. Smith. 24pp. 9 pl. 8. p. 1881, 1. .30
- 48 Topley W. Gold & Silver; Geol. Distribution & probable future Position. 26pp. 4 pl. 8. st. '87, 1. .25
- 49 Trask J. R. Geol. of Coast Mts. & Part of Sierra Nevada. Resources in Mining etc. 95pp. 8. st. '54, 3. .200
- 50 " Mines & Mining in Cal. 23pp. 8. unib. '55, 1. .20
- 51 Tullock Mine. Cal. Report by Silliman, Clayton et al. 11pp. map, sect. 4to. p. 1867, 1. .25
- 52 Tyson P. T. Geol. & Industrial Resources of Cal. (much on Gold Regions). 164pp. 9 maps & sect. 8. 1851, 1. 1.50
- 53 U. S. Mineral Resources, Reports on. see No. 70741.
- 54 U. S. Monetary Com. Report and Documents, 2 vol. 1292pp. 8. '77 & '79, 1. 50; or, hmo. 1. 1.50
- 55 Ute Park Land Improvement Co. map, 8. p. '82, 1. .20
- 56 Vallecillo Min. Co. Silver Mine of " Jesus Maria," Mex. Reports by Posselt et al. 32pp. 8. st. '53, 1. .30
- 57 Van de Water Gold & Silver Min. Co. 8. p. 1879, 1. .15
- 58 Van Wagenen. Hydraulic Mining. 95pp. '80, new, .70
- 59 Vivian J. H. Description of the Process of Amalgamation. 22pp. 8 pl. 19 fig. 4to. hef. 1825, 2, rare, 1.50
- 71710 Waddington. Gold Lodes & Quartz Veins. 8. unib. '54, 1. .10
- 1 Wadsworth M. Gold in Maine etc. 8. p. 1881, 1. .25
- 2 Waite. Condition of Silver in Litharge. A. I. M. '86, 1. .10
- 3 Weaver. Former Irish Gold-workings. 8. unib. '75, 1. .15
- 4 Wetherbee J. Letter on Colorado Matters to the Stockholders of Excelsior Co. 51pp. 8. p. 1867, 1. .30
- 5 Wheatley H. B. Art Industries in Pottery and the Precious Metals. 278pp. 4 col. pl. 220 il. 8. 1886, 1. 2.00
- 6 Wheeler & Randall. Quartz Operators Hand Book. 130pp. 1865, 1. .75
- 7 White Hall Gold Mines, Va. Report on. 8. p. 1. n. d., 2.0
- 8 White Mt. Silver & Lead Min. Co. N. H. Reports by Richardson & Shepherd. 32pp. map, 2 pl. il. 8. st. '63, 1. .50
- 9 Whittlesey C. Lone Rock Silver Mining Property, Ontonagon Co. Mich. il. 8. st. '87, 1. .15
- 71720 Wilderness Gold Mining Co. Va. 8. p. 1881, .75
- 1 Williams A. Popular Fallacies regarding Precious Metal Ore Deposits. 15pp. 8. unib. 1883, 1. .25
- 2 " Gold & Silver Conversion Tables. 8. p. '83, 1. .10
- 3 " Settling Tanks in Silver Mills. A. I. M. '83, .10
- 4 " C. P. Gold & Silver in North Mo. 8. unib. '77, 1. .15
- 5 Woods J. E. Geol. Obs. in South Australia (Gold Region etc.). 422pp. map, 4 pl. 32 il. 8. '62, 2. 2.00
- 6 Wurmb M. v. Island of Celebes or Macassar and Account of its Gold Mines etc. 8. unib. 1800, 1. .20
- 7 Wurtz Amalgamation Co. N. Y. Assay by Torrey and Sodium Amalgamation by Wurtz. 32pp. 8. p. '66, 1. .25
- 8 Young W. et al. Mining Notes in Cal. map, W. '79, .15
- 9 Emmons S. F. Geol. & Mining Industry of Leadville. 499pp. 45 pl. 4to. & folio Atlas of 25 sheets, '89, new, 8.40
- 71730 Farrar S. H. Gold Fields of S. Africa. 8. p. '86, 1. .25
- 1 Liversidge A. Some New South Wales Minerals. 2 pl. 2 fig. of crystallized Gold, 3 il. 8. p. 1884, 1. .25
- 2 Sidney S. The Three Colonies of Australia. Their Pastures, Copper Mines and Gold Fields. 427pp. 10 pl. 44 il. 8. 1852, 1. 1.50

Papers from Am. Jour. of Science and Arts.

- 71740 Alger. Crystallized Gold from Cal. 10 il. 1850, .15
- 1 Blake W. P. Papers. Extent of Cal. & Oregon Gold Region. '55, 15; Telluride of Silver in Cal. '57, 10; Parallelism between Deposit of Auriferous Drift of Appalachian Gold Field and of Cal. '58, 15; Carboniferous Age of Gold-bearing Rocks of Cal. '68, .10
- 2 Bondorf. Analysis of Red Silver. 1822, .15
- 3 Brewer W. H. Papers. Age of Gold-bearing Rocks of Pacific Coast. '66, 10; Age of Gold-bearing Rocks. '68, 10
- 4 Clarke W. B. Gold of Australia. 1852, .10
- 5 Cullen Dr. Gold Mines of Darien. 1851, .10
- 6 Del Rio. Analysis of Gold alloyed with Rhodium. '26, 50
- 7 Discovery of Gold in Australia. 1855, .10
- 8 Eaton A. Papers. Gold of the Carolinas in Talcose Slate. '30, 15; Gold of Mex. & of N. C. etc. '31, .10
- 9 Engelmann. Separat. of Gold & Silver from Lead. '42, 10
- 71750 Gibbon J. H. Gold of North Carolina. 1845, .10
- 1 Gold in Rhinebeck, Dutchess Co. N. Y. 1869, .10
- 2 Gold Mining in Virginia. 1849, .10
- 3 Jackson. Extracting Pure Gold from Alloys. '48, .10
- 4 Kimball J. P. Silver Mines of Santa Eulalia, Mex. 15pp. 1870, .15
- 5 Lyman C. S. Papers. '49. Obs. on Cal. (Gold Regions etc.). 10; Notes on Cal. Gold Regions. .10
- 6 Mather W. W. Reduction of Iron and Silver Ores and Principal Silver Mines of Mex. & So. Am. 25pp. '33, .25
- 7 Maury M. F. Alembic for Distilling Amalgam of Gold. 1838, .15
- 8 Mitchell E. Geology of Gold Region of N. C. 19pp. map, 1829, .50
- 9 Olmsted D. Gold Mines of N. C. 1825, .15
- 71760 Rivot M. Analysis of Cal. Gold. 1840, .10
- 1 Rivero M. de Rich Mine of Pasco. 21pp. col. map, '29, .25
- 2 Silliman B. Papers. Culpepper & U. S. Gold Mines, Va. '37, 10; Gold Mines and Gold Regions of Va. 33pp. '37, .20; Deep Placers of the South & Middle Yuba, Nevada Co. Cal. 19pp. '65, 10; Some of the Min. Districts of Arizona near the Rio Grande. 20pp. '66, 20; Grass Valley Gold Min. Dist. '67, 10; Mode of Occurrence of Gold & Silver in Calaveras Co. Cal. '68, .15
- 3 Silliman & Whelpley. Mechanical & Chem. Treatment of Gold and other Metals. 1864, .10
- 4 Smith F. L. Notice of the Gold in N. C. 1837, .15
- 5 Wathen H. G. Gold Fields of Victoria. 1854, .10

COPPER.

(See also Books and Papers under Mineralogy, Mining, etc.)

- 71780 Ackerman. Die Kupfer fuhrenden Schichten am Lake Superior. 8. unb. 1876, G. 1. .15
- 1 Argall & Kinahan. Recovery of Copper from its Solution in Mine Drainage. 27pp. 2 pl. 8. unb. 1882, 1. .35
- 2 Ascroft Min. Co. Lower Canada. Reports etc. by Petherick, Williams et al. 23pp. 8. p. 1864, 1. .20
- 3 Bett's Cove Mining Co. Newfoundland. Report on Mines of, etc. 16pp. 8. p. 1879, 1. .15
- 4 Bischoff C. Das Kupfer und seine Legirungen. 332pp. 11. 8. 1865, G. new. .160
- 5 Blake. Estimation of Copper in Speise. A. I. M. '81, 10
- 6 Blandy J. F. Lake Superior Copper Rocks in Pennsylvania. A. I. M. '79. .15
- 7 Brooke H. B. Arseniates of Copper. pl. 10 fig. 8. unb. 22, 1. .20
- 8 Callender. Lake Superior Copper Mines. 8. unb. '54, 1. .15
- 9 Chapman E. J. Occurrence of Copper Ore in Island of Grand Manan. Bay of Fundy. pl. 8. unb. '72, 1. .25
- 71790 Clemson. Flemington, N. J. Copper Ore. 8. unb. '84, 1. .15
- 1 Coggin. Treatment of Copper Slime. A. I. M. '83. .10
- 2 Copper Region of Michigan. 8. unb. 1864, 1. .10
- 3 Copper Smelting at Hafod Works. 8. unb. '58, 1. .15
- 4 Courtis W. M. Animikie Rocks and their Vein Phenomena as shown at Duncan Mine. A. I. M. '87. .15
- 5 Dana J. F. Analysis of Copper Ore of Franconia, N. H. and Remarks on Pyritous Copper. N. Y. Lye. '28. .15
- 6 " E. S. Crystallization of Native Copper. 17pp. 4 pl. 54 fig. 8. p. or unb. 1886, 1. .70
- 7 Dickeson M. W. Geol. Survey & Examination of Lands of Dalton Min. Co., Va. 8. p. 1857, 1. .25
- 8 " Report on Geol. Survey and Condition of the Highland's Copper Mining Co., Me. 8. p. 1. .25
- 9 Douglas J. Papers. 8. unb. Copper Mines in Chili. 24pp. 72, 30; Native Copper Mines of Lake Superior. 19pp. 1874. .15
- 71800 Egleston T. Papers. 8. p. or stitched. 1. Copper Dressing in Lake Superior. 47pp. 23 il. '78, 30; Copper Mining in Lake Superior. 3 il. '78, 30; Copper Refining in the U. S. 53pp. 4 pl. 40 fig. '80, 20; Ore Knob Copper Process. 33pp. 3 pl. 13 fig. '81, 10; Treatment of Enargite. '82, 10; Tellurium in Copper. '82, 10; Bessemerizing Copper Mattes. 16pp. '85, 10; Point Shirley Copper Works. 25pp. '86, 15; Separation of Gold and Silver from Black Copper at Oker. 4 pl. '85, 15; Extraction of Copper Ore at Agordo. 39pp. 7 il. '88. .15
- 1 Eustis W. C. Papers. A. I. M. '82. Contrib. to Metallurgy of Copper and Nickel. 15; Copper Analysis. .15
- 2 Farnham J. R. Copper Mining in Orange Co. Vt. 23pp. 8. unb. 1872, 1. .50
- 3 Forbes D. Purple Copper Ore. 8. unb. 1851, 1. .15
- 4 Foster & Whitney. Report on Geology and Topography of Lake Superior Land District. See No. 70518.
- 5 Frazer P. Papers. A. I. M. Copper Deposits, Carroll Co. Md. map, il. '80, 15; Hypothesis of the Structure of the Copper Belt of the South Mt. il. '83. .10
- 6 Gilpin. Copper Ore in Nova Scotia. il. 8. p. 77, 1. .10
- 7 Gustafs & Carlbergs Kopparverk Bruks-och Landt Egendom. map. 4to. p. 1858, Swedish, 2. .25
- 8 Grand Portage Copper Co. map, pl. 8. 1865, 1. .30
- 9 Henderson C. H. Copper Deposits of the South Mountain. map. A. I. M. 1883. .15
- 71810 Henwood. CopperTurf of Merioneth. 8. unb. '57, 1. .15
- 1 Hjelm. Art of Hardening Copper. 8. unb. 1799, 1. .15
- 2 Howe H. M. Copper Smelting. 107pp. 8. p. 1883, 1. .20
- 3 " Papers. A. I. M. Direct Process of Copper Smelting. il. 78, 15; Efficiency of Fans & Positive Blowers. pl. '82, 10
- 4 Hunt R. Table of Copper produced from the Mines of Cornwall & Devon, 1845 to '47. 8. unb. '48, 1. .20
- 5 " T. S. Copper Localities in the Eastern Townships & Seigniories of Can. 27pp. 8. unb. '66, 1. .35
- 6 " Hydrometallurgy of Copper. 18pp. A. I. M. '81 & '87. .25
- 7 Irving R. D. Copper-bearing Rocks of Lake Superior. 45pp. 13 col. maps & sect. 16 col. pl. 59 fig. of thin sect. 37 il. 4to. '83. new. 1.50; or, Abstract of same. 100pp. 11 col. maps & sect. 4 col. pl. of thin sect. 10 il. 8. unb. '84, 1. .75
- 8 Isle Royale and Ohio Min. Co. Articles of Agreement & Desc. of Property. 2 maps by J. Locke, p. 46, 2. .50
- 9 Jackson C. T. Halifax Copper Mine. il. 8. st. '62, 1. .20
- 71820 " Geological Survey & Report on Wickham Copper Mining Co.'s Property. Can. 2 col. pl. il. 8. p. '62, 1. .35
- 1 " Chem. Analysis of Chrysocolla from the Holquin Copper Mines. Cuba. B. J. 1857. .20
- 2 " Report on Geol. and Mineral Survey of the Mineral Lands in Mich. See No. 70573.
- 3 " C. F. Production of Copper East of the 100th Meridian. 4to. stitched, 1881, 1. .15
- 4 Journal of Copper Mining Operations, Jan. '54 to July '56. 264pp. 8. unb. 1. .50
- 5 Karsten C. J. B. Verschiedene Zustände des hammergaaren Kupfers. 19pp. 4to. unb. G. 1830, 1. .25
- 6 Kunz. Copper Minerals from Arizona. 8. st. '85, 1. .10
- 7 Lamborn. Metallurgy of Copper. 1875, new. .80
- 8 McDowell F. H. Recent Improvements in Copper Smelting. 2 pl. 6 fig. A. I. M. 1884. .20
- 9 Mackintosh J. B. Electrolytic Determination of Copper & Formation of Allotropic Copper. A. I. M. '81. .15
- 71830 Map of a Portion of the Copper District, Mich.. Lake Superior. col. 22 x 33 inches, in cover, 1873, 1. .35
- 1 March W. J. Simple Process of Extracting Copper from its Poor Ores. 8. unb. 1857, 1. .15
- 2 Min. & Industrial Co. of the Two Republics of N. A. Description of Property, By-Laws, etc. 8. p. 1882, 1. .15
- 3 Morgan J. L. Smelting of Refractory Copper Ores, with Wood as Fuel, in Australia. pl. 3 fig. 8. p. 1864, 1. .20
- 4 Munroe H. S. Papers. A. I. M. Losses in Copper Dressing at Lake Superior. 42pp. il. '79, 20; Weight, Fall and Speed of Stamps. pl. il. 1880. .15
- 5 Newberry. Copper Production in Arizona. 8. unb. '85, 1. .10
- 6 Nicholson St. Genevieve Copper Deposit. A. I. M. '82, 20
- 7 Norwich Mine. Lake Superior. Condition and Prospects of. pl. map, 2 sect. 8. p. 1853, 2. .25
- 8 " Same, with Report by I. Coe. map. 8. p. 1855, 2. .25
- 9 Paddon J. Tables for Copper Ore, giving the Price of a Ton of Ore, from 80L. to 180L. per ton of Copper, at any Produce from 3 to 25 parts in 100. 35pp. sh. '79, 2. .15
- 71840 Peters. Am. Methods of Copper Smelting. 8. '88, new. .320
- 1 Phillips W. Copper Ores from Cornwall (Conduirite), with Analysis by Faraday. 8. unb. 1827, 1. .70
- 2 Piggot A. S. Chemistry and Metallurgy of Copper. 388pp. 15 il. 1858, 2. .50
- 3 " Manassas Copper Mine. 17pp. 8. p. 1853, 1. .50
- 4 Pioneer Mills Mine. N. C. Report etc. 8. st. 1860, 1. .15
- 5 Richardson C. S. Papers. 8. unb. 1. Hartford Mining Co.'s Property at Bristol, Conn. '54, 25; Old Bristol Copper Mine, Conn. '54. .15
- 6 Rockland Min. Co. Reports. each about 16pp. 8. p. 1. .20
- 7 Sack. Kupperzerze von Adelaide. 8. unb. '50, G. 1. .25
- 8 Sage, B. G. Papers. 8. unb. 1. Determin. of Sulphur and Iron in Copper Ore. 1860, 10; Method of giving the Grain and Hardness of Steel to Copper. 1860. .10
- 9 St. Clair Min. Co. Mich.. Reports. 8. p. 1, each. .20
- 71850 Salisbury. Drift Copper. map. 8. unb. '86, 1. .15
- 1 Schrauf A. Phosphorkupferzerze. 33pp. pl. 10 fig. 8. unb. G. 1879, 1. .35
- 2 Semons W. Silicates of Copper. 8. unb. 1879, 1. .20
- 3 Silliman & Whitney. Report on the Bristol Copper Mine. Bristol, Conn. 32pp. pl. 8. p. 1855, 3, rare. .40
- 4 Spencer J. W. Nipigon or Copper-bearing Rocks of Lake Superior. 27pp. 2 pl. 8. unb. '76, 1. .25
- 5 Taylor. Copper Region, Gibara, Cuba. A. P. Trans. '45, 20
- 6 Union Consolidated Mining Co. Ducktown, Tenn. Report by Am. Bureau of Mines. 27pp. pl. 4to. p. '66, 2. .35
- 7 Wendt A. F. Copper Ores of the Southwest. 52pp. 2 pl. 23 il. A. I. M. 1880. .30
- 8 Whitney J. D. South Echo Location of the Canada Mining Co. map. 8. unb. 1855, 1. .70
- 9 Whittlesy C. Ancient Mining on the Shores of Lake Superior. 34pp. map, 30 il. Sm. Con. '63. .100
- 71860 " Hill & Campbell. Reports on Property of Phenix Copper Co. Mich. 28pp. 4 col. maps & sect. 8. 1855, 1. .30
- 1 Williams C. P. Copper Deposits, Shannon Co. Mo. il. 8. unb. 1877, 1. .20
- 2 Winchell N. H. Papers. A. A. S. Cuprififerous Series in Minn. '81, 13; Typical Thin Section of Rocks of the Cuprififerous Series in Minn. '82. .15
- Papers from Am. Jour. of Science and Arts.
- 71870 Beck L. C. Native Copper Ores of Copper etc. found in the Vicinity of New Brunswick, N. J. 1830. .10
- 1 Bowen. Silicious Hydrate of Copper from N. J. '24, 10
- 2 Burra Burra Copper Mine, So. Australia. '48. .10
- 3 Copper Smelting in Japan. 1849. .15
- 4 Influence of Bismuth on Ductility of Copper. '54. .10
- 5 Jackson C. T. Papers. Copper and Silver of Keweenaw Point. '45, 25; Copper of Lake Superior Region. '49, 10
- 6 Native Copper of Wallingford, Conn. '18. .10
- 7 Pratt. Copper Sulphurets from Canton, Ga. Mine. '57, 15
- 8 Richardson. Copper Ore of Stratford, Vt. 1862. .10
- 9 Ruggles D. Copper Mines of Lake Superior. il. 45, 25
- 71880 Schoolcraft H. R. Papers. Copper Mine on Lake Superior. '24, 15; Native Copper on the Southern Shore of Lake Superior. 16p. '21. .25
- 1 Silliman & Whitney. Geol. Position and Character of the Copper Mine at Bristol, Conn. il. '55. .15
- 2 Smelting Copper Ore. 1847. .10
- 3 Townsend J. B. Large Mass of Native Copper. '64, 10
- 4 Tuomey. Ducktown, Tenn. Copper Mines. il. '55. .15
- 5 Williams & Blandy. Copper Range of L. Superior. 62, 10

METEORITES.

- 72140 Abel-Remusat M. Cat. des Bolides et des Aerolites observes a la Chine, etc. 16pp. 4to. unib. '19, F. 1, 50
- 1 Aerolites, etc. Production of. 8. unib. 1815, 1, 15
- 2 Ansted. Falling Stars and Meteorites. 8. unib. '63, 1, 20
- 3 Apjohn. Analysis of Meteoric Stone. 8. unib. p. 74, 1, 15
- 4 Bailey. Rensselaer Co. N. Y. Meteorite. il. 8. st. '87, 1, 15
- 5 Barcelona M. Mexican Meteorites. P. Ac. '75, 20
- 6 Baudin and Chladni. Fiery Meteor seen in Gascony, July 24, 1790. 8. unib. 1798, 1, 30
- 7 Biot. Fire Ball which fell near Laigle. 8. '03, 1, 20
- 8 Blake. Green Co., Tenn., Meteorite. pl. il. 8. p. '86, 1, 20
- 9 Bowditch N. On the Meteor which passed over Wilmington, Del., Nov. 21, 1819. 4to. unib. 1819, 1, 35
- 10 Brenneck F. On Meteorites. Sm. 1869, 10
- 1 Brezina A. Meteoritensammlung des Min. Hofkabinetes, Wien. 126pp. pl. 13 fig. 8. unib. 1885, G. 1, 85
- 2 Brezina. Meteorite Fall at Dhulia. 8. unib. '79, 1, 10
- 3 Brongniart et al. Meteor lumineux et Chute de Pierres meteoriques du 14 Mai. 4to. unib. '64, F. 1, 25
- 4 Cavaroz. Ossements fossiles decouverts en Mexique. Corps d'Origine meteorique. 4to. unib. '64, F. 1, 20
- 5 Chladni E. F. Feuer Meteor und die mit denselben herabgefallenen Massen. Vol. Text, 438pp. 8 hef. 1819, G. 1, and folio Atlas of 10 pl., 250
- 6 " Papers, 8. unib. 1798, 1, Fire Balls and Hard Bodies, which have fallen from the Atmosphere, 20; Mass of Iron found in Siberia, 20
- 7 Cloez M. S. Analyse chimique de la Pierre Meteorique d'Orgeuil. 4to. unib. 1864, F. 1, 20
- 8 Coulvier-Gravier M. Sur les Globes Filants ou Bolides. 4to. unib. 1865, F. 1, 25
- 9 Dana E. S. Catalogue of Collection of Meteorites in Peabody Museum of Yale College. 8. st. or unib. '86, 1, 10
- 72160 " & Penfield. Meteorites from Utah and from Cape Girardeau, Mo., undescribed. 8. st. or unib. '86, 1, 10
- 1 Daubree M. Papers, 4to. unib. '64, F. 1, Note sur deux Aerolithes. 25; Note sur les Meteorites tombee le 14 Mai aux Environs d'Orgeuil, 20
- 2 Daubree et al. Nouveaux Renseignements sur le Bolide du 14 Mai '64. map. 4to. unib. '64, F. 1, 35
- 3 De Dree M. Papers, 8. unib. 1803, 1, Stones said to have fallen at Ensisheim, etc., 20; Stones which fell near Ville Franche, France, 20
- 4 Delalande. Stones from the Atmosphere. 8. unib. '03, 1, 15
- 5 De la Noe. Bolide a Metz, '65. 4to. unib. '65, F. 1, 20
- 6 Denning W. F. Papers, 8. unib. '60, 1, Meteors and Meteor Stones. 17pp. il. 35; August Meteors. il., 30
- 7 Des Cloizeaux et al. Carbonate de Magnesia, Breunherite etc. dans Meteorite d'Orgeuil. 4to. unib. '64, 1, 20
- 8 Dhurmsalla Aerolith. 5 pp. 8. unib. 1863, 1, 25
- 9 Diruf C. J. Ideen zur Naturerklarung der Meteor-oder Luftsteine. 157 pp. bds. 1805, G. 2, 300
- 72170 Drummond T. On Meteoric Stones. 8. unib. '19, 1, 15
- 1 Ellicot A. Flight of Meteors. A. P. Trans. 1804, 1, 25
- 2 Ennis. Meteors and their Trails. A. A. S. '72, 1, 25
- 3 Everest. Fall of a Meteorite in India. 8. unib. '35, 1, 15
- 4 Faye M. Papers, 4to. unib. F. 1, Sur une Essai de Reproduction Artificielle d'un Mineral Cosmique. '63, 25; Composition des Aerolithes du Chili et du Mex. '64, 25
- 5 Fisher. Iron Meteorite from Wis. pl. il. 8. p. 1, '87, 1, 20
- 6 Fletcher L. Introduction to Study of Meteorites and List of Meteorites in Brit. Museum. 77pp. il. 8. '86, 1, 15
- 7 Flight W. Chapter in the History of Meteorites. 145pp. 3 pl. (1 col.) il. 8. unib. '75, 1, 250
- 8 " Examination of Meteorites of Cranbourne, Australia, of Rowton, Shropshire, and of Middlesborough, Yorkshire, 15pp. pl. 9 fig. il. 4to. p. 1882, 1, 100
- 9 Forshey C. G. Meteors of August '39. A. P. Trans. '41, 20
- 72180 Forster T. I. M. Mem. sur les Etoiles Filantes et sur les Meteors en general. 76pp. 8. st. 1846, F. 1, 50
- 1 Fouque et Levy. Experiences synthetiques relatives a la Reproduction artificielle des Meteorites. 4to. unib. '81, F. 1, 20
- 2 Fourcroy C. Stones which have fallen from the Atmosphere and particularly near Laigle. 8. unib. 1803, 1, 15
- 3 Fulda F. C. Obs. on Fire Balls. 8. unib. 1799, 1, 15
- 4 Gent F. A. On an Undescribed Meteor from East Tennessee. 2 pl. 5 fig. 8. p. or unib. 1886, 1, 35
- 5 " New Meteoric Iron from N. C. A. P. 1870, 1, 10
- 6 Glaisher et al. Reports on Observations of Luminous Meteors. 8. unib. 1. 1862 to '63. 131pp. il. 1, 25; 1872 to '73. 55pp. il. 1, 50; 1873 to '74. 91pp. 2 pl., 75; 1876 to '77. 66pp., 75; 1877 to '78. 120pp. il., 100
- 7 Goiran, Bertolio et al. Sopra Gli Aeroliti caduti il Giorno 29 Febr. 1868 nel Territorio di Villanova e Motta del Conti. 111pp. col. map. pl. p. 1868, I. 1, 75
- 8 Gould B. A. Lunar Origin of Aerolithes. A. A. S. '60, 15
- 9 Haidinger W. Meteorsteinfall in 1866 bei Knyhnya, Ungarn. 48pp. 3 pl. 7 col. fig. 8. p. '66, G. 1, 75
- 92190 Hayes I. I. Fragment of a Meteorite. P. Ac. '62, 15
- 1 Head. Meteoric Stones in India. 8. unib. 1862, 1, 25
- 2 Huntington O. W. Papers, 8. p. 1, Crystalline Structure of Iron Meteorites. 21pp. il. 8. '80, 20; Cat. of all Recorded Meteorites. 74pp. 5 pl. 16 fig. '87, 1, 00; Crystalline Structure of the Coahuila Irons, 4 il. '88, 20
- 3 Irish C. W. Account of the Detonating Meteor of Febr. 12, 1875. 16pp. col. map, il. 4to. bds. '75, 1, 200
- 4 Izarn J. Des Pierres Tombees du Ciel, ou Lithologie Atmospherique. 429pp. hcf. Paris 1805, F. 1, rare, 250
- 5 Jackson C. T. Papers, B. Meteoric Iron from Col. '66, 10; Anal. of Meteoric Iron from Los Angeles, Cal., 15
- 6 " Nouvel Aerolithe, etc. 4to. unib. 1864, F. 1, 25
- 7 Kirkwood D. Papers. A. P. Eight Meteoric Fire Balls seen in the U. S. '76 to '77. '77, 10; Meteoric Fire Balls seen in U. S. '78 to '79. '79, 10; Theory of Meteors. A. A. S. '67, 20
- 8 Kunz G. F. 8. p. or unib. 1. Washington Co., Penn., Meteorite. '85, 10; Three Masses of Meteoric Iron from Glorieta, Mt. N. Mex. 4 pl. il. '85, 20; The Meteorites from Glorieta, Mt. 6 pl. 9 fig. il. '85, 50; Meteoric Iron from Jenny's Creek, Wayne Co., W. Va. 3 il. '86, 10; Meteoric Iron from Ark. map. 2 pl. il. '86, 1, 20; E. Tenn. Meteorite. '87, 10; Chattooga Co., Ga., Meteorite. map. il. '87, 10; Waldron Ridge, Tenn., Meteorite. '87, 10; Two New Meteorites from Carroll Co., Ky., and Carzoe, Mex. 10 il. '87, 10; Powder Mill Creek Meteorite. il. '87, 10; Taney Co. Meteorite, Mo. pl. il. '87, 10; Two New Masses of Meteoric Iron. pl. 4 fig. '88, 10
- 9 Lalande J. D. History of Astronomy for 1803 (contains account of Meteorites). 23pp. 8. unib. 1804, 1, 30
- 72200 Largest Mass of European Meteoric Iron. 8. unib. 125, 1, 15
- 1 Laugier M. Papers 8. unib. 1. New Principle in Meteoric Stones. 1806, 15; Meteoric Stones, 1820, 15
- 2 Lespaul M. Chute probable d'un Bolide manifeste par le Bruit de l'Explosion. 4to. unib. '64, F. 1, 20
- 3 Lewis H. C. Papers, 8. unib. 1. New Minerals in Meteorites. '82, 10; Nomenclature of Meteorites. '83, 10; Native Iron from N. J. '84, 10; Recent Meteorites, '84, 10
- 4 Liversidge. Deniliquin Meteorite. 3 pl. 8. p. '80, 1, 25
- 5 Lockyer J. N. Papers, 4to. unib. 1. Researches on Meteorites. il. '87, 20; Notes on Meteorites. il. '88, 25; Origin of Celestial Species. 21pp. 6 il. 8. '89, 25
- 6 Lowe. Meteor of Nov. 27, '62. il. 8. unib. '63, 1, 15
- 7 Maclear T. Fall of a Meteoric Stone in the Cold Bokkeveld, Cape of Good Hope. 4to. unib. 39, 1, 25
- 8 Mallet. Meteoric Iron from Va. il. 8. st. '78, 1, 25
- 9 Marsh. Day-light Meteor, Nov. 15, '59. 8. st. '60, 1, 15
- 72210 Merrill. San Emigdio Meteorite. pl. 10 fig. 8. st. '88, 1, 35
- 1 Meteoric Iron, Character of, etc. 8. unib. 1818, 1, 20
- 2 Meteorites, Photographs of. 3 1/2 x 6 inches, each, 15
- 3 Meteoric Stone of 1511. 8. unib. 1819, 1, 10
- 4 Meteoric Stone from Bavaria. 8. unib. 1805, 1, 20
- 5 Meteoric Stones, Masses of Iron etc. fallen from the Heavens from earliest Period to 1819. 8. unib. '19, 1, 25
- 6 Meunier S. Papers, 4to. unib. F. 1, Products d'Oxydation des Fers Meteoriques. '73, 25; Nature chimique du Sulfure de Fer (trouille) dans les Fers meteoriques. '74, 20; Contribution a l'Histoire geologique du Fer de Pallas. '80, 20; Hist. geologique de la Syssidere de Lodran. '82, 20; Analyse mineralogique de la Roche empatee dans la Syssidere d'Atacama. '82, 20; Determination lithologique de la Meteorite d'Estherville, Emmet Co., Iowa. '82, 25
- 7 Morogus B. D. Chronological Cat. of Stones and other Large Masses fallen on the Earth. 8. unib. 1814, 1, 20
- 8 Mueller H. Meteoric Iron from Zacatecas, Mex. etc. Text, pl. 8. unib. 1858, 1, 50
- 9 Nevill. Catalogue of Meteorites. 8. st. n. d. 1, 35
- 72220 Noehden. Meteoric Stones in Vienna Museum, 8. unib. '17, 1, 15
- 1 Nordenskiold. Aerolithes from Finland. 8. unib. '23, 1, 15
- 2 Olbers. Stones fallen from the Heavens. 8. unib. 1803, 1, 15
- 3 Philippi. Meteoric Iron of Atacama. 4to. unib. '55, 1, 25
- 4 Pierson W. M. Large Meteorite in Mex. Sm. '74, 10
- 5 Pisani M. Papers, 4to. unib. '64, F. 1, Etude Chimique et Analyse de l'Aerolithe d'Orgeuil. 20; Analyse de l'Aerolithe de Tourinnes-la-Grosse (Belgique). 20
- 6 Pistolet. Meteoric Stone near Langres. 8. unib. '16, 1, 15
- 7 Powell B. Report on Observations of Luminous Meteors 1851 to '52. 6app. il. 8. unib. 1853, 1, 50
- 8 Rapport sur deux Memoires de I. Domeyko relatifs l'un a des masses d'Aerolithes trouvees dans le Desert d'Atacama, etc. 4to. unib. '64, F. 1, 30
- 9 Reichenbach. Meteorite in Moravia. 8. unib. 1835, 1, 15
- 72230 Rittenhouse & Page. Acct. of a Meteor. A. P. Trans. 1786, 15
- 1 Rivero & Boussingault. Masses of Iron found in the E. Cordillera of the Andes. pl. 3 fig. 8. unib. '24, 1, 30
- 2 Saemann M. L. La Meteorite de Tourinnes-la-Grosse

- (Belgique) Dec. 7, '63. 4to. unb. '64. F. 1. .25
- 3 Salverre E. Conjectures on the Stones which have fallen from the Atmosphere. 8. unb. 1803, 1. .20
- 4 Semsey A. v. Meteoritensammlung des Ungarischen National Museums, Budapest. 8. p. 1886, G. 1. .25
- 5 Shepard C. U. Papers A. J. etc. Analyses of Meteoric Iron of La. etc. '29, .50; Min. and Chem. Desc. of the Va. Aerolite. il. '29, .50; Meteoric Iron from Ashville, N. C. '39, .10; Native and Meteoric Iron. il. '41, .15; Analyses of Meteoric Iron from Cocke Co., Tenn. '42, .15; Phosphate of Lime in the Va. Meteoric Stone. '43, .15; Fall of Meteoric Stones in Iowa. '47, .10; Meteoric Stone of Concord, N. H. il. '47, .10; Meteorite of Castine, Me. '48, .10; Rammelsberg's Analysis of the Juvenas Meteoric Stone. '48, .10; Meteoric Iron of Seelassgen, Brandenburg. '48, .10; Report on Am. Meteorites. 55pp. 12 il. '48, .60; or Same, 46pp. il. unb. '46 to '48, .40; Meteoric Iron in S. C. '49, .10; Meteoric Stone of Deal, N. J. and Probable Date of Fall of Ruff's Mt. Meteoric Iron. A. A. S. '52, .15; Meteoric Iron from Lion River, S. Africa. il. '53, .15; Meteoric Iron from Cayuga Co. N. Y. '53, .10; Three Masses of Meteoric Iron at Tucson, Sonora. '54, .15; Localities of Meteoric Iron. '54, .10; New Locality of Meteoric Iron in So. Africa and in Mex. '56, .15; Meteoric Iron from N. C. and Shooting Meteor seen to fall at Charleston, S. C. 10pp. 13 il. '59, .30; Notice of several Am. Meteorites. il. '60, .10; Cat. of Meteoric Collection. '61, .10; Meteoric Iron from Cohahuila, Mex. il. '66, .10; New Classification of Meteorites. '67, .10; New Meteoric Irons in U. S. '69, .15; On Aerolites. 15pp. '79, .10; Additional Notice of the Estherville Meteorite. '80, .10; Meteoric Iron of Lexington Co. S. C. '81, .10
- 6 "C. U. Jr. Cat. Meteoric Collection of. 4to. st. '83, 1. .15
- 7 St. Amans. Fall of Aerolites near Agen. 8. unb. '15, 1. .15
- 8 Silliman B. Two Am. Meteoric Irons. A. A. S. '51, .10
- 9 " & Kingsley. Origin and Composition Meteoric Stones, Fairfield Co. Conn. 21pp. A. P. Trans. '04. .05
- 72240 " Shower Meteoric Stones, Weston. 8. unb. '08, 1. .20
- 1 Smith J. L. Meteoric Stones. 24pp. il. Sm. '56. .10
- 3 " New Meteoric Iron from Mex. A. P. '67. .15
- 3 " Masse de Fer Meteorique. 4to. unb. '73, F. 1. .25
- 4 Soemann. Aerolites with Low Velocities. 8. unb. '64, 1. .15
- 5 Sorby. Microscopical Struct. of Meteorites. R. S. '64, .20
- 6 " Physical History of Meteorites. 8. unb. '65, 1. .15
- 7 Steininger. Noeggerath & Chladni. Native Iron of Bittsburg and Meteoric Iron of Jiquipilco. 8. unb. '27, 1. .20
- 8 Stromeyer. Analysis of Meteoric Stone. 8. unb. '21, 1. .10
- 9 Taylor. Examination of a Nickel Meteorite. P. Ac. '75, .20
- 72250 Thury. Meteoric Iron in France. 8. unb. '28, 1. .15
- 1 Tilloch. Another Stone from the Clouds. 8. unb. '04, 1. .20
- 2 Tissot et Lartigue. Bolide a Paris, '64. 4to. unb. 1. .20
- 3 Tschermak G. Formation of Meteorites and Volcanic Agency. 8. unb. 1876, 1. .25
- 4 " Meteoriten aus der Wueste Atacama. 10pp. 4 pl. 11 fig. 4to. p. G. 1871, 3. .60
- 5 Vauquelin. Stones from the Heavens. 8. unb. '03, 1. .20
- 6 Villiers du Terrage et Dumas. Meteore observee a Paris et Sevres, Fev. 17, '65. 4to. unb. '65, 1. .20
- 7 Vogt. Organismes des Meteorites. 4to. unb. 1881, F. 1. .25
- 8 Walker S. C. Researches on the Periodical Meteors of August and September. 54pp. A. P. Trans. '41. .50
- 9 Wright. Gases in Meteorites. 8. p. or unb. '76, 1. .15
- 72260 Zuercher & Margolle. Meteors, Aerolites, Storms, Atmospheric Phenomena. 324pp. 16 pl. il. '70, 1. .50
- Papers from Am. Jour. of Science and Arts.**
- 72270 Aerolites in Brazil. 1838. .30
- 1 African Meteorite, Oct. 13, 1838. 1839. .10
- 2 Andrews, Evans et al. Fall of Meteoric Stones at New Concord, Ohio, May 1, 1860. il. 1860. .10
- 3 Berzelius. On Meteoric Stones. 1839. .15
- 4 Brandes Dr. Examination of a Substance called Shooting Star found in a Meadow. 1829. .50
- 5 Brush G. J. Papers. Meteorite of Orgeuil. 1865, .10; Alabama Meteoric Stone. il. 1869. .15
- 6 Carver S. D. Meteoric Stone, Nanjemoy. Md. '25. .50
- 7 Cassels L. P. Meteorite of Hindostan, '57. il. '61. .10
- 8 Chilton G. Analysis of the Md. Aerolite. 1826. .35
- 9 Clark's Metallic Meteorites, Notice of. 16pp. 1853. .15
- 72280 Clarke W. A. Origin of Shooting Stars. il. '36. .10
- 1 Cold Bokkeveld (Africa) Meteorite. 1841. .15
- 2 Davis N. K. Meteor of July 8th. 1857. .10
- 3 Dean J. Meteors. 1823. .15
- 4 Duflos & Fischer. Analysis of Meteoric Iron that fell near Braunau, Bohemia, July 14, '47. 1848. .50
- 5 Dufrenoy M. Meteorite of Chateau Renard. '42. .10
- 6 Eberhard. Meteoric Iron from Thuringia, and Woehler. Meteoric Stone of Mezo-Madaras. Siebenburg. '56. .15
- 7 Evans E. W. Path and Velocity of the Guernsey Co. (Ohio) Meteor of May 1, 1861. .10
- 8 Fall of a Meteorite at Grueneberg, Silesia etc. '42. .10
- 9 Faraday. Anal. of Cold Bokkeveld Meteorites. '39. .10
- 72290 Gardner J. Note on a Meteor. il. 1864. .10
- 1 Genth F. A. Papers. New Meteorite from N. Mexico. '54, .10; Meteoric Iron from Sarepta, etc. '63. .10
- 2 Gibbon J. H. Meteorite in N. C. 1850. .10
- 3 Gibbs W. Carbonaceous Matter of Meteorites. '69. .10
- 4 Graves R. Gelatinous Meteor. 1820. .30
- 5 Greg R. P. Meteoric Iron from Chili. 1857. .15
- 6 Haidinger W. Papers. Meteoric Falls. il. '61, .10; Meteoric Irons. '64, .10; Meteorite of Mamboum, Bengal. '65, .10; Phenomena of Light, Heat and Sound accompanying the Fall of Meteorites. '69. .10
- 7 Hayes A. A. Papers. Native Iron from Liberia, Africa. '56, .15; Supposed Meteorite from Marblehead. '58, .10
- 8 Henry J. Mass of Meteoric Iron in Col. 1866. .10
- 9 Herrick E. C. Papers. Meteorite, E. Bridgewater, Mass. '37, .10; Meteoric Showers of April 20th, 1803, and Obs. on April 20, '39. '39, .10; Meteor in Conn. Dec. 14, '37. '39, .15; Fall of a Meteorite in Mo. Febr. 13, '39. '39, .10; Meteors of April 18 to 20, '41. '42, .10
- 72300 Herschel. Chem. Exam. African Native Iron. '39, .10
- 1 Hicks H. Fall of a Aerolite, Forest Hill, Ark. '48. .10
- 2 Hitchcock E. Meteors of Nov. 13, 1833. 1834. .15
- 3 Jackson C. T. Papers. Analysis of Meteoric Iron from Claiborne, Ala. '38, .10; Meteoric Iron from Col. '67, .10
- 4 Jackson & Hayes. Alabama Meteoric Iron. '44. .20
- 5 Joy C. A. Analysis of Meteorite from Chili. '64. .10
- 6 Kirkpatrick H. Circumstances attending the Tennessee Meteorites, May 9, 1827. 1830. .10
- 7 Kirkwood, D. Meteoric Fireball, July 13, '46. '66. .10
- 8 Laugier. Composition of Meteoric Stones. 1823. .10
- 9 Le Conte J. L. Meteoric Iron, Sonora, Mex. '52. .10
- 72310 Leydolt F. Meteoric Stone of Borkut. 1858. .10
- 1 Loomis E. Papers. Meteor of May 18, '38, etc. '39, .10
- 2 Meteor Nov. 15, '59. '60, .10; Remarkable Meteor. '69, .10
- 3 Malleable Iron of La. 1824. .35
- 4 Marsh B. V. Luminosity of Meteors. 1853. .10
- 5 Maskelyne N. S. Aerolitics, etc. il. 1863. .10
- 6 Meteoric Iron in Bohemia. 1831. .10
- 6 Meteoric Iron in Texas and in France. 1838. .10
- 7 Meteorite. Juvenas, France, June 22, 1822. .10
- 8 Meteorites of Aumale, Algeria, etc. '66. .10
- 9 Meteors of Nov. 14, 1868. '69. .10
- 72320 Mudge B. F. Meteorite, Kan. June 6, '68. '68, .10
- 1 Newton H. A. Papers. Meteor of Nov. 15, '69. '60, .10; Meteoric Fire Balls, Aug. '60. '61, .10; Grand Meteor, Aug. 10, '61. il. '61, .10; Meteors of Nov. 1869. '70, .10
- 2 Olmsted, D. Papers. Meteors of Nov. 13, '33. 82pp. il. '34, .35; Meteoric Shower, Nov. '36. '37, .15; Meteoric Shower of Nov. '37. 16pp. il. '38, .10; Meteoric Shower, Nov. '38. '39. .10
- 3 Peters T. M. Meteor of July 1856. '57. .10
- 4 Percival J. G. Supposed Meteorite. 1824. .10
- 5 Pierce N. Anal. Meteoric Iron, Otsego Co., N. Y. '43, .10
- 6 Rammelsberg C. F. Some N. Am. Meteorites. '62, .10
- 7 Read S. C. Native Iron. 1848. .10
- 8 Reall N. Georgia Meteor and Aerolite. 1830. .10
- 9 Reichenbach. Fall of a Meteorite in Moravia. '36. .10
- 72330 Remarkable Meteor at Fayetteville, N. C. 1845. .10
- 1 Root O. Meteoric Iron, Seneca River, N. Y. '52. .15
- 2 Rose G. Meteoric Mass found at Schwetz. '52. .10
- 3 Schaefer G. C. Meteors of Aug. '37, Nov. '32. 1838. .10
- 4 Shumard. Fall of Meteoric Iron, St. Louis, Mo. '62, .10
- 5 Silliman B. Papers. Native Iron, Canaan, Conn. '27, .25; Meteoric Iron from Cambria, N. Y. il. '45. .35
- 6 Silliman et al. Meteor of Aug. 11, 1859. '59. .10
- 7 Silliman & Hunt. Meteoric Iron of Tex. and Lockport. pl. taken directly from the iron, il. 1846. .30
- 8 Silliman & Kingsley. Meteor, Weston, Conn. '69. .10
- 9 Smith J. L. Papers. Memoir on Meteorites. 32pp. 5 il. '55, .30; Meteoric Stones. Harrison Co. Ind. '59, .10; Three Meteoric Irons from Ky. and N. C. '63, .10; Guernsey (Ohio) Co. Meteorites. il. '61, .10; Three new Meteorites from Ky. and Tenn. '61, .10; Bishopville Meteoric Stone. '64, .10; Meteoric Iron, Wayne Co., O. '64, .10; New Meteorite from Ark. '65, .10; Colorado Meteorite. '66, .15; Cohahuila Meteoric Irons of 1868. '69, .15; Wisconsin Meteorites. '69, .15; Meteoric Stones, Danville, Ala. '70, .10; Franklin Co. Ky. Meteoric Iron. '70, .10; Meteoric Stone, Stewart Co. Ga. 1870. .10
- 72340 Sorby H. C. Phys. Hist. of Meteorites. 1866. .10
- 1 Szabo J. Meteorite in Hungary, June '66. 1866. .10
- 2 Tennessee Meteorite. 1830. .10
- 3 Troost G. Papers. Analysis of Meteoric Mass from Tenn. '40, .20; Meteoric Iron from Tenn. and Ala. 3 il. '45, .35; Three Meteoric Irons from Tenn. and Ky. '46, .30
- 4 Twining A. C. Papers. Meteors of Nov. 13, '33. 33pp. pl. '34, .20; Meteors of Nov. 13, '34. '35, .15; Meteor Rings as affected by the Earth. 15pp. il. '62. .15
- 5 Willet J. E. Papers. Meteoric Iron from Putnam Co. Ga. '54, .10; Meteoric Stone, Stewart Co. Ga. '70. .10

GENERAL MINERALOGY.

(See also Mineralogy, Mining, Gold and Silver, etc.)

- 72910 Adams H.T.W. Alphabet of Geol. and Elements of Mineralogy. 70pp. 1868, 1. .15
- 1 Aikin A. Tour through N. Wales & Part of Shropshire. Obs. on Mineralogy etc. 253pp. pl. 8. bds. 1797, 3. .150
- 2 " & Pepys. Analysis of Satin Spar. 8. unb. 1801, 1. .10
- 3 Arfvedson, Berzelius et al. Analyse de quelques Mineraux (Lepidolite, Chabasie etc.) 4to. unb.'19, F. 1, .25
- 4 Baumhauer. Boracit. 15pp. 2 pl. 13 fig. 8. unb. '79, 1, .30
- 5 Bayley W. S. Quartz-Keratophyre from Pigeon Point, and Irving's Augite-Syenites. il. 8. p. or unb. '89, 1, .15
- 6 Beccheri J.J. Physica Subterranea et Specimen Beccherianum Stahlii. 1394pp. pl. parchment, Lipsiae 1703, 3. rare and curious work. .350
- 7 Beckmann. Pumice Stone, where found. 8. unb. 1799, 1, .20
- 8 Bell L. Manufacture of Salt near Middlesbrough. 30pp. pl. 4 fig. il. 8. p. 1887, new. .30
- 9 Berthier. Arsenical Nickel etc. 8. unb. '20, 1. .15
- 72920 Berzelius. On Vanadium. 31pp. 8. unb. '31, 1. .35
- 1 Bindheim. Cadmia of Zinc. Cobalt etc. 8. unb. 1799, 1, .25
- 2 Blumenbach J.F. Elements of Natural History. 435pp. 2 pl. 32 fig. 8. bds. '25, 2, 105pp. devoted to Mineralogy. .50
- 3 Bolton H.C. Index to the Literature of Uranium, 1789 to 1885. 36pp. 8. p. 1885, new. .10
- 4 Brande W. T. Report of Lectures on Mineralogical Chemistry. 55pp. 8. unb. 1817 & '18, 1. .35
- 5 Braun. Nickelspeise (Placodin). il. 8. unb. '79, G. 1, .15
- 6 Brewster. Action of Heat on Glauberite. 8. unb. '32, 1, .15
- 7 Broegger W.C. Untersuchungen Norwegischer Mineralien & Atakmit von Chili. 17pp. 3 pl. 8. unb. '79, 1, .35
- 8 Brongniart. Websterite from near Paris. 8. unb. '28, 1, .15
- 9 Brush G. J. Am. Spodumene. A. A. S. 1881, .10
- 72930 Bryce J. List of Simple Minerals of Counties of Down, Antrim & Derry. 8. unb. 1833, 1. .20
- 1 Bucholz C. F. Native Molybdena etc. 8. unb. 1803, 1, .10
- 2 Carro, de. Mineralogy of Ceylon. 8. unb. 1806, 1. .15
- 3 Chandler F. Miscellaneous Chem. Researches (Analysis of Zircon, Saussurite, etc.). 52pp. 8. p. '57, 1. .100
- 4 Church. Green "Garnets" from Urals. 8. unb. '79, 1, .20
- 5 Clark & Chatard. Mineral, Rock, Ore, & other Analyses. 40pp. 8. p. 1884, 1. .10
- 6 Clarke T.W. Reports on Work done in Laboratory of the U. S. Geol. Surv. (Analyses of Minerals etc.) 8. p. 1. '83 to '84. 40pp. .10; '84 to '85. 80pp. .15; '85 to '86. 152pp. map, il. .20
- 7 Cleaveland P. Treatise on Mineralogy and Geology. 2 vol. 830pp. 5 pl. 158 fig. 8. hcf. 2d ed. 1822, 2. .200
- 8 Collie. Celestine & Baryto-Celestine. 8. unb. '79, 1, .15
- 9 Collins J.H. Mineralogy of Cornwall & Devon. 206pp. 10 pl. 246 fig. 8. 1876, 1. .300
- 72940 Conrad S. W. Mineral which approaches to the Bildstone of Werner, etc. P. Ac. J. 1829, .15
- 1 Cordier C. Argentiferous Mercury. 8. unb. 1802, 1. .15
- 2 Cornalia E. Notizie Geo-Mineralogiche sopra Alcune Valli Meridionali del Tirole. 49pp. col. map, col. pl. of sect. pl. 43 fig. 4to. stitched, 1848, Italian, 1. .200
- 3 Crosby. Tables for Determ. Minerals, new, last ed. 1,00
- 4 Cuvier M. Theory of the Earth with Mineralogical Illustrations by Prof. Jameson. 477pp. 6 pl. 8. bds. '22, 3, .50
- 5 Dana J. D. Isomorphism of Chem. Compounds comprised under Species Tourmaline. A. A. S. '52. .15
- 6 " E. S. Crystallographic Study of the Thimolite of Lake Lahontan. 31pp. 3 pl. 39 fig. 8. p. '84, 1. .15
- 7 " & Penfield. Form of Polianite. il. 8. p. or unb. '88, 1, .15
- 8 Davy. Wavellite from Devonshire. 8. unb. 1805, 1. .20
- 9 De Luc. Cryst. Bodies in Lava. 27pp. 8. unb. 1807, 1, .25
- 72950 Dodge. Anal. of Minn. Minerals etc. 8. unb. '84, 1, .20
- 1 Endlich. List of Minerals in Nat. Mus. '73. Sm. '74, 10
- 2 Farey. Matlock Lime changed to Silice. 8. unb. '08, 1, .35
- 3 Feuchtwanger. Cat. of Mineral Collect. 31pp. st. '74, 1, .15
- 4 Foote A.E. Twin Crystals of Zircon. P. Ac. '82. .15
- 5 Forbes. Electricity of Tourmaline etc. il. 8. unb. '34, 1, .15
- 6 Foster & Barnett. Guide to Mus. of Royal Geol. Soc. of Cornwall. Penzance. 15pp. 8. p. 1880, 1. .10
- 7 Fraas O. Die Nutzbaren Minerale Wuertemberg's. 216pp. 25 il. hfn. 1860, G. 1. .60
- 8 Gardner J. Tripoli, Dubois Co., Ind. il. 8. unb. '74, 1, .25
- 9 Gay-Lussac. Kermes Mineral. 8. unb. '30, 1. .10
- 72960 Genth. Barnhardtite, Bronchantite etc. P. A. '67, 10
- 1 Gmelin. Analyses of Tourmalines. 8. unb. '28, 1. .15
- 2 Goodchild. Nat. Hist. of Gypsum. 21pp. 8. unb. '88, 1, .25
- 3 Gosse D. Baths of St. Filippo and Formation of Stone Medallions by the Water. pl. 8. unb. 1820, 1. .20
- 4 Hagen H.A. Amber in North Am. B. 1874, .20
- 5 Haidinger W. Prof. Mitscherlich's Obs. on Dimorphism of Hydrour Sulphate of Zinc etc. 8. unb. '26, 1, .10
- 6 Hartley W. N. Mineral Cavities and their Contents. 10 il. 8. unb. 1877, 1. .35
- 7 Haushofer. Krystallform der Borsaeure. il. 8. unb. '82, 1, .25
- 8 Haüy. Analyses of Chromite & Zoisite. 8. unb. '08, 1, .15
- 9 Hawes G.W. Report on Mineralogy. Sm. 1880, .20
- 72970 Hedinger J.M. Desc. of Castleton, Derbyshire, Nat. Curiosities & Mineral Productions. 37pp. pl. p. 15, 1, .20
- 1 Heine C. J. Chem. Untersuchung der Soelen, Salze, Gradir u. Siede Abfaelle von den Salinen der Provinz Sachsen. 366pp. 8. unb. 1845, G. 1. .150
- 2 Hidden. Mineralogical Notes. il. 8. p. or unb. '88, 1, .10
- 3 How to Study Mineralogy. Geol. etc. 188pp. 1. .20
- 4 Humboldt A. de. Essai Politique sur le Royaume de la Nouvelle Espagne. 2 vol. 1097pp. 4to. hcloth, 1811, F. 1, and folio Atlas, 20 maps, profiles etc. (some col.), hcloth, 1, much on Mineralogy etc. rare. .1250
- 5 Irby. Krystallformen des Kalkspath. il. 8. unb. '79, 1, .25
- 6 Johnston. Dimorphism of Baryto-calcite. 1. unb. '35, 1, .15
- 7 Johnston-Lavis J. Fragmentary Ejectamenta of Volcanoes. pl. with 3 photo-micrographs. 8. unb. '86, 1, .20
- 8 Karsten. Gegenseitige Beziehungen von Anhydrit, Steinsalz u. Dolomit. 31pp. 8. unb. '48, G. 1. .25
- 9 Kennedy R. Analysis of Zeolite. 8. unb. 1802, 1. .10
- 72980 Kirwan R. Mineralogical and Chemical Nomenclature. 17pp. 8. unb. 1800, 1. .20
- 1 Klaproth. Papers. 8. unb. 1. Analyses of various Minerals. 31pp. 1803, 20; Native Cinnabar of Japan. 1805, 15
- 2 Koenig G. A. Papers. P. Ac. Min. Notes on Magnet Cove, Kans. '76, .10; Tantalite, Yancey Co. N. C. '76, 15; Pachnolite and Thomsenolite. '76, 15; Coloring Matter of Amazon Stone from Pike's Peak etc. '76, 10; Astrophyllite, Arfvedsonite and Zircon. '77, 15; Strengite from Rockbridge Co. Va. etc. il. '77, 20; Min. Notes: Mineral from Bear Creek, Col. '77, 15; Notes on Monazite. '82, 10; Composition of Stromeyerite. '86, .20
- 3 Laspeyres H. Mineralogische Bemerkungen. Epidotgruppe. 53pp. il. 8. unb. 1879, G. 1. .40
- 4 Lee S.E. Glossary of Geol. & Min. 8. unb. '86, 1, .25
- 5 Leidy J. On Tourmalines. P. Ac. '82, .15
- 6 List of Geological and Mineralogical Collections in Great Britain & Ireland. 8. unb. 1820, 1. .35
- 7 Longchamp. Formation of Saltpetre. 8. unb. '13, 1, .15
- 8 Marcet. Lessons on Minerals etc. 130pp. il. '44, 3, .25
- 9 Melville. Form of Cryolite. pl. 8. unb. '82, 1. .35
- 72990 Newbold. Kunker. Tuffaceous Deposit, India. '45, 10
- 1 Nicol W. Cavities Containing Fluids in Rock Salt. 8. unb. 1829, 1. .30
- 2 " J. Elements of Mineralogy. 352pp. 257 il. '58, 2, 1, 25
- 3 Penfield & Sperry. Triclinic Feldspars. il. 8. st. '87, 1, 10
- 4 Phillips & Aikin. Cornish Schieferspath. 8. unb. '02, 1, 15
- 5 Phillips & Levy. Forms of Haytorite. il. 8. unb. '27, 1, 15
- 6 Reinhold E.S. Papers, P. Ac. Diorite. '81, 10; Pyrophyllite & Alunogen in Coal Mines. '82, .10
- 7 Rose G. Crystallized Compounds of Osminum and Iridium found in the Ural. il. 8. unb. '34, 1, .15
- 8 Royal Institution of Cornwall, Catalogue of Non-Metallic Minerals. 64pp. 8. p. 1878, 1. .20
- 9 Russell I. C. Geol. Hist. of Lake Lahontan. 41pp. col. map, 5 pl. of Thimolite, Tufa etc. 13 il. 8. unb. '83, 1, .50
- 73000 Senarmont M. de. Formation artificielle de Mineraux. 4to. unb. '49, F. 1, .20; or, Abstract in Engl. A. J. '49, .10
- 1 Shepard. Mineralogy of Red River Surv. 8. unb. '54, 1, 15
- 2 Spilgatis H. Identitaet des sogenannten unreifen Bernsteins mit Krantzit. 8. unb. '72, G. 1, .15
- 3 Stevens. Obs. on Min. & Geol. of Venezuela. P. Ac. '68, 10
- 4 Stockdale F.W. L. Excursions in Cornwall. Principal Towns, Mines etc. 203pp. map, 49 pl. bds. '24, 3, 150
- 5 Teschemacher J. Mineralogical Notices (Glauberite from Peru, Pyrrhite, Pyrophyllite etc.). B. J. '44, .25
- 6 Teschemak & Sipoez. Die Clittonitgruppe. 20pp. pl. 9 fig. 8. unb. 1879, G. 1. .30
- 7 Welsh J.K. Mineralogy. 404pp. pl. 77 il. '82, 2, 100

Papers from Am. Jour. of Science and Arts.

- 73010 Alger F. Papers, Beaumontite and Lincolnite identical with Heulandite. '43, 10; Formula of Jackson's Masonite. '44, .10
- 1 Bailey. Plumbic Ochre from Mexico. 1849, .10
- 2 Bechi. Analyses of several Native Borates. '54, .10
- 3 Becquerel M. Formation of Arragonite etc. 1852, .10
- 4 Berthier. Ores of Manganese. 1824, .10
- 5 Berzelius J.J. Analysis of Russian Platina. '30, .10
- 6 Bird & Silliman. Minerals from Palestine. '26, .15
- 7 Blake J.H. Papers, Geol. & Misc. Notices (Nitrate of Soda etc.) of Tarapaca, Peru, map, '42, 15; Crystallized Oxyd of Chromium. il. '50, 10; Method of Distinguishing between Biaxial and Uniaxial Micas. 4 il. '51, 10; Examination of Chlorite. il. '51, 10; Apatite, Brown Tourmaline etc. '52, 10; Mineralogical Curiosities of the Paris Exposition of 1867. '68, .15
- 8 Booth. Hessian Deutarseniuret of Nickel. '36, .10
- 9 Bowen G. T. Papers, Analysis of Calcareous Oxide of Tungsten. '22, 15; Analysis of Pyroxene Sahite. '22, 15; Analysis of Strontian etc. '22, .15

- 73020 Boye H. Analysis of Magnetic Iron Ore containing Nickel, from Gap Mine, Lancaster Co. Pa. '52. 15
- 1 Bronghiart. Obs. relating to Mineralogy etc. '21. 20
- 2 Brown S. Curious Substance which accompanies the Native Nitre of Ky. & of Africa. '18. 10
- 3 Brush G. J. Papers. American Spodumene. 50, 55; Composition of Clintonite. '54. 10; Chalcodite. '58. 15; Mineralogical Notices. '58, 23; Boltonite. '59. 10; Trephoite. '64. 10; Crystallized Diopside as Furnace Product. '65. 10; Mineralogical Notes. '66. 10
- 4 Burton B. Contributions to Mineralogy. '68. 10
- 5 Camac W. Analysis of Fowlerite. 1872. 10
- 6 Chandler C. F. New Metal in the Native Platinum of Rogue River, Oregon. 1862. 10
- 7 Charpentier M. de Couzeranite. 1829. 10
- 8 Clark T. E. Fichtelite from North Bavaria. il. '58. 25
- 9 Clarke F. W. Papers. New Process of Mineral Analysis. '68. 10; Researches on Lithia Micas. '66. 15; Studies in the Mica Group. '87. 10
- 73030 Clingman T. J. Native Platinum in N. C. '47. 10
- 1 Comstock. Am. Cinnabar & Native Lead. '19. 10
- 2 Connell A. Papers. Analysis of Gmelinite. '39. 10; Nomenclature of Metals in Columbite & Tantalite. '54. 10
- 3 Cook. Dimorphism of Antimony, Zinc, etc. '61. 10
- 4 Crossley R. Analysis of Algerite. 1850. 10
- 5 Czudnowicz C. Eusynchite & Dechenite. '64. 10
- 6 Dana J. D. Papers. Identity of Thomson's Trolite with Columbite. 311. '57. 15; Eremite. il. '43. 10; Origin of constituent and adventitious Minerals of Trap and allied Rocks. 16pp. '45. 25; Fluor Spar, Apatite and Chondrodite in Limestone. '44. 10; Danburite. il. '50. 10; Some Minerals investigated by M. Hermann. '50. 10; Obs. on Mica Family. '50. 10; Spodumene. il. '50. 10; New Crystalline Form of Staurolite etc. il. '50. 10; Mineralogical Notices. 75pp. il. '50 to '54. 75; Labradorite from Maui Isl. il. '54. 10; Crystallographic Identity of Eumanite and Brookite. il. '51. 10; Proposito of Scheerer. '54. 10; Chem. Contributions to Mineralogy. 16pp. il. '54. 20; Contributions to Mineralogy. 17pp. '54. 20; Possible identity of Turnerite and Monazite. '66. 10
- 7 Daubeny. Sketch of Geol. etc. of Sicily. 27pp. '26. 35
- 8 Delafield J. American Andalusite. 1823. 10
- 9 Delesse A. On Pyrite. 1844. 10
- 73140 Des Cloizeaux. Papers. '67. Crystalline Form of Pachnolite. il. 10; Optical Characters of Margarite. 10
- 1 Dewey C. Papers. Crystallized Steatite; with Barton. On Virginia Fluor Spar. '22. 15; Analysis of Argentine and Crystallized Steatite. 23. 10
- 2 Douglass Prof. Sulphate of Strontian. '21. 10
- 3 Edelman. Artificial Formation of Minerals. '52. 10
- 4 Edwardsite. Perfect Crystals of. il. 1838. 10
- 5 Emmons E. Papers. Heulandite, Pimelite, Pinite, etc. '26. 10; Strontianite discovered in the U. S. '35. 10
- 6 Epistilbite from Elba. 1833. 10
- 7 Ferrara. Notices of Geol. & Min. of Sicily. '24. 15
- 8 Fleuchtwanger L. Papers. Minerals not yet described in Common Systems. 50. 10; Mineral. Notices. '42. 10
- 9 Foot L. Notices in Geol. & Mineralogy. '22. 15
- 73050 Fox. Pseudomorphous Quartz Crystals. '46. 10
- 1 Garrett. Minerals associated with Serpentine. '52. 15
- 2 Genth F. A. Papers. Pyrophyllite, Chrysolite, Scolecite, etc. '54. 15; Hererite identical with Smithsonite. '55. 10; Bismuthine, Cantonite etc. '57. 15; Contributions to Mineralogy. 17pp. '62. 15
- 3 Geodes. Formation of Crystals in. 1824. 10
- 4 Gmelin M. Analysis of Tourmaline. 1828. 10
- 5 Guillemin M. Gelatinous Quartz. 1828. 10
- 6 Hagemann G. Papers. Crystallized Cryolite. '66. 10; Min. associated with Cryolite. '66. 10; Ivigite. '69. 10
- 7 Hall. Minerals from Palestine. 15pp. '25. 20
- 8 Hall & Silliman. Oriental Minerals. 1838. 10
- 9 Hayes A. A. Papers. Peru Native Nitrate of Soda. '40. 10; Re-examination of Microcline and Pyrochlore. '43. 10; Pickeringite. '43. 10; Borcalcite. '54. 10
- 73060 Hitchcock E. Papers. New Mineralog. Hammer. il. 21. 10; Chlorophane etc. '26. 15; Lincolnite. '44. 10
- 1 Hoffmann E. Analyses of Chabasites. 1833. 10
- 2 How H. Natro-boro-calcite in Gypsum. '57. 15
- 3 Hubbard O. P. Papers. Geol. & Mineralogical Notices. il. '57. 10; Rutile and Chlorite in Quartz. il. '50. 10
- 4 Hugard J. A. Description of the Mineralogical Cabinet of the Garden of Plants. Paris. 1856. 10
- 5 Hunt T. S. Papers. Chem. Constitution of Warwickite. '51. 10; Am. Columbite, Samarskite etc. '52. 15; Algerite. '51. 10; Note on Shepard's Cherkovine. '57. 10; History of Euphotide and Saussurite. '59. 15
- 6 Jackson C. T. Anal. of Pitchstone Porphyry etc. '51. 10
- 7 Johnson & Blake. Papers. '67. Native Crystallized Terpin. 10; Kaolinite and Pholerite. il. 10
- 8 Johnston. Large Crystal of Colombite. il. 1836. 10
- 9 Karsten M. Amorphous Boracite. 1847. 10
- 73170 Kersten. Bismuth Cobalt Ore. 1827. 15
- 1 Kokscharow. Papers. Crystallization of Uralorthis. il. '49. 10; Clinocllore of Achmatowsk. il. '55. 10
- 2 Koschukli F. v. Notes on the Caucasus. 21pp. '68. 10
- 3 Macgown Dr. Alum in China. 1838. 15
- 4 Malay Peninsula. Geol. and Mineralogy of. 1845. 10
- 5 Mallet J. W. Papers. Zeolitic Mineral from Isl. of Skye. '56. 10; Brewsterite. '59. 10
- 6 Mather. Xanthine & its Crystalline Form. il. '80. 10
- 7 Mead W. Analogy between the Minerals of the North of Europe and of America. 1827. 25
- 8 Meneghini Prof. Mineralogical Notices. 1852. 15
- 9 Mexico. Miscellaneous Notices of, il. of Obsidian Knife. 1839. 15
- 73080 Michaelson. Swedish & Norwegian Minerals. '64. 10
- 1 Native Sulphur from Java. A. J. 1815. 10
- 2 Pearce J. B. Minerals of Chlorite Group. 1864. 10
- 3 Peckham S. F. Albertite & allied Minerals. 1860. 10
- 4 Phil'p's Mineralogy, by Alger, & Shepard's Treatise on Mineralogy. Review of. 19pp. 1844. 15
- 5 Pisani F. Papers. Shepard's Paracolumbite. 1861. 10; Corundophilite of Shepard. 1863. 10
- 6 Plumbago and Black Lead Pencils. 1837. 10
- 7 Porcelain and Porcelain Clays. 1818. 10
- 8 Prehnite-Olivine. Analyses of. 1825. 10
- 9 Ramsdberg C. Papers. Const. of Tourmaline. '51. 10; Petalite and Spodumene. '53. 10; Crystallographic & Chem. Relations of Hornblende and Augite. '58. 15
- 73090 Regnault. Mica containing Potash & Lithia. '39. 10
- 1 Repetti E. Soft Crystal of Quartz. 1822. 10
- 2 Rogers R. & W. Carbon Deferm. in Graphites. il. '48. 10
- 3 Rose H. Papers. Different Varieties of Columbite. '45. 10; New Metal Pelopium. in Tantalite. '47. 10; Composition of Columbite. '63. 10
- 4 Rose Mica Lepidolite. Analysis of. 1830. 10
- 5 Scacchi & Dana. Humite of Monte Somma. 7 il. '52. 20
- 6 Seybert H. Papers. Analysis of Tabular Spar, Pyroxene and Colophonite. '22. 15; Analysis of Molybdenum. '24. 15; Discovery of Fluoric Acid in Condrodite. '23. 10; Analyses of Chrysoberyls from Haddam and Brazil. '24. 15; Analysis of Hydrate of Iron, Mcmouthe Co. and of Melanite, Franklin. N. J. '24. 15
- 7 Shepard C. U. Papers. Reply to Del Rio's "Obs. on Treatise of Mineralogy." '35. 15; Identity of Edwardsite with Monazite, & Composition of Missouri Meteorite. '40. 10; Two Decomposed Varieties of Iolite. '41. 10; Want of Identity between Microcline and Pyrochlore. '42. 15; Tautolite, Arkansite etc. il. '47. 10; Pyrophyllite, Brookite etc. il. '49. 10; Mineralogical Notices. '64 and '65. 20; Scheelite and Uwarowite. '66. 10; Mineral Notices. '63. 10; Paracolumbite and Corundophilite. '66. 10; Mineral Phosphate, Redonda. W. I. '69. 10; Mineralogical Contributions. '70. 10
- 8 Silliman B. Papers. Notices in Mineralogy etc. (Snowy Gypsum, Corneliens etc.) '22. 15; Massive Yellow Oxide of Tungsten. '23. 10; Mineral Caoutchouc. '23. 10; Some American Minerals (Emeryite, Corundellite, Euphyllite etc.) 18pp. '49. 15; Optical Examination of American Minerals. '50. 10
- 9 Smith J. L. Papers. Memoir on Emery. 30pp. il. '50. 20; Re-examination of American Minerals. 19pp. '53 & '54. 20
- 1 Stromeyer. Analyses of Arragonite, Magnesite, Picropharmacolite, Strontianite, Celestine etc. '44. 10
- 73100 Stevens, Eggleston et al. Report on Geol. & Mineralogical Specimens collected in Frobisher Bay. '63. 10
- 1 Teschemacher J. E. Papers. Blowpipe Charac. of Pyrochlore of Azores. '44. 10; Uranium & Pyrochlore. '45. 10
- 2 Teschemacher & Hayes. Identity of Pyrochlore with the Microcline of Prof. Shepard. 1842. 15
- 3 Thomson T. Analysis of Anophyllite of N. Y. '31. 10
- 4 Torrey J. Papers. Staurolite. il. 1819. 10; Siderographite. 1820. 10
- 5 Tyler & Shepard. Analyses of Rahtite, Marcyite and Monorolite. 1866. 10
- 6 Webster J. W. Papers. Analysis of Wacke. '19. 10; Asbestos in Anthracite. '19. 10; Siliceous Sinter of the Azores. '21. 10; New South Shetland Minerals etc. '22. 15
- 7 Wells D. A. Distribution of Manqanese etc. '52. 10
- 8 Wetherill C. M. Experiments on Itacolumite. '67. 15
- 9 Whitney J. D. Papers. Chloritoid and Masonite. '49. 10; Composition of Algerite and Apatite. '54. 15; Chem. Composition of Pectolite. '50. 10
- 73110 Winslow M. Mineralogy of Ceylon. 1823. 10
- 1 Wolle C. A. Supposed Kercynite. 1860. 10
- 2 Wright A. H. Notices of Koordistan (Lead Mines, Sulphur, Salt etc.) 1847. 10
- 3 Dana E. S. Papers. Chondrodite from Tilly Foster Mine. 15pp. 8 pl. 22 fig. il. '76. 20; Samarskite of Mitchell Co. N. C. '76. 10; Twins of Staurolite & Pyrochlore. '76. 10
- 4 * Wells. New Mineral, Berylionite. Text. pl. 10 fig. '89. 20

Assaying, Blowpipe Analysis, Etc.

- 72350 Aaron. Assaying. Part 1. Gold & Silver Ores. '84, new, 1,20; Parts 2 & 3. Gold & Silver Bullion. Lead, Copper, Tin, Mercury, Zinc, Nickel, Cobalt. '85, new, 2,00
- 1 Accum F. Use & Application of Chem. Tests, & Analysing Metallic Ores, etc. 327pp. 2 pl. 31 figs. hcf. '20, 1,25
- 2 " Analysis of Minerals. 236pp. stitched, 1809, 1,35
- 3 Atwood. Blow-pipe Assaying. il. '81, new, 1,20
- 4 Balling C. A. M. Fortschritte im Probirwesen 1879 to '86. 194pp. il. 8. p. 1887, G. new, 1,60
- 5 Berzelius J. J. Use of Blowpipe in Chem. & Mineralogy. transl. by Whitney. 252pp. 4 pl. 35 figs. '45, 1,40; or 3,25
- 6 Bodemann & Kerl. Assaying of Lead, Copper, Silver, Gold and Mercury. 214pp. 4 pl. 42 figs. 1872, 1,125
- 7 Brown. Manual of Assaying. il. new, last ed., 1,40
- 8 " Complete Gas Assaying Plant. il. A.I.M. '84, 1,10
- 9 Brush G. J. Determinative Mineralogy, with Introduction on Blowpipe Analysis. il. 8. 6th ed. '84, new, 2,80
- 72360 Buzengeiger. Blowpipe Flame Colors. 8. unb. '29, 1,15
- 1 Chapman E. J. Gas Blowpipe, with Experiments. 112pp. pl. il. 8. bds. 1819, 2, celebrated & rare work, 2,00
- 2 " Strictures on above, by Hare. 22pp. 2 pl. A.J. '20, 2,25
- 3 " Newman's Blowpipe. 20pp. il. 8. unb. '17, 1,15
- 4 Classen A. Quantitative Chemische Analyse durch Electrolyse. 189pp. pl. 41 il. 8. 1886, G. new, 1,50
- 5 Cornwall. Blowpipe Analysis. il. 8. '82, new, 2,00
- 6 Cramer A. Assaying. 488pp. 6 pl. 78 figs. 8. cf., 1741, 2,150
- 7 Crookes. Select Methods in Chemical Analysis (chiefly inorganic). il. 8. 2d ed. 1886, new, 7,50
- 9 Daniell. New Oxhydrogen Jet. il. 8. unb. '33, 1,15
- 72370 Elderhorst W. Blowpipe Analysis. 179pp. 3d ed. '66, 2,30; or 6th ed. by Nason & Chandler. 312pp. pl. 1911, 74,3, 50
- 1 Egleston T. Papers, 8. p. '78, 1. Commercial Analysis of Furnace Gases. il., 15; Doyere Method of Analyzing Blast Furnace Gas. 15pp. 8 il., 20
- 2 Emerson G. E. Observations on Crystals and Precipitates in Blowpipe Beads. 19pp. il. 8. unb. '65, 1,20
- 3 Griffin J. Use of Blowpipe. 324pp. 5 pl. bds. '27, 2,50
- 4 Hare. Application of Blowpipe. 17pp. pl. 8. unb. '02, 1,20
- 5 Haussman. Blowpipe Assay of Minerals. 8. unb. '14, 1,15
- 6 Joyce F. Chem. Mineralogy. 388pp. pl. bds. '25, 2,75
- 7 Kemp. Improved Blowpipe etc. il. 8. unb. '29, 1,25
- 8 Kerl B. Assayer's Manual. 301pp. il. 8. '84, new, 2,40
- 9 " Probirkunst. 540pp. 8 pl. 172 figs. 8. p. G. '66, 2,100
- 72380 Landauer. Blowpipe Analysis. 171pp. col. pl. 15 il. '79, 1,100
- 1 Lieber O. M. Assayer's Guide. 133pp. 4 pl. 1856, 1,100
- 2 Mitchell J. Manual of Practical Assaying. 579pp. 360 il. 2d ed. 1854, 1,250; or 3d ed. by Crookes. 788pp. 188 il. 8. '68, 1,400; or 5th ed. 1881, new, 8,00
- 3 Newman J. A new Blowpipe. 8. unb. 1817, 1,10
- 4 Overman. Mineralogy, Assaying etc. 230pp. '58, 2,25
- 5 Plattner C. F. Die Probirkunst mit dem Loethrohr. 788pp. 78 il. 8. 3d ed. 1859, G. 2,100
- 6 " Same. transl. with Notes by J.S. Muspratt. 382pp. 43 il. 8. orig. ed. 1845, 1,100; or 2d ed. 420pp. 46 il. 8. '50, 2,100; or 3d ed. 422pp. 47 il. 8. 1854, 2,75
- 7 " Same, revised by Richter. 564pp. pl. 87 il. 8. '72, 1,300
- 8 Plympton. The Blowpipe. il. 1881, new, 1,20
- 9 Ricketts P. de P. Notes on Assaying & Assay Schemes. 172pp. 30 il. '76, 1,00; or 8th ed. 210pp. 31 il. 8. '86, 1,200
- 72390 Rammelsberg C. F. Quantitative Chem. Analysis, especially of Minerals & Furnace Products. 240pp. 8,71,1,75
- 1 Richards R. H. Assay Spitzlute. il. A. I. M. '81, 2,25
- 2 Ross W. A. The Blowpipe in Chemistry, Mineralogy & Geology. 196pp. 120 il. last ed. new, 1,25
- 3 " Alphabetical Manual of Blowpipe Analysis. il. London 1880, new, 2,00
- 4 Rutter. New Oxhydrogen Blowpipe. 8. unb. '32, 1,15
- 5 Sanders. Pract. Use of Blowpipe. 269pp. 14 il. '58, 2,75
- 6 Scheerer T. Loethrohrbuch. 302pp. 30 il. '57, G. 4,50
- 7 " Same. transl. by Blanford. 244pp. 10 il. '56, 1,50
- 8 Smith A. Blowpipe Characters of Minerals. 56pp. 8. unb. 1861, 1,35
- 9 Springer A. The Torsion Balance. il. A.I.M. '84, 1,10
- 72400 Totten J. G. New Support for Minerals subjected to the action of the Common Blowpipe. N.Y. Lyc. '24, 20
- 1 Troilius. Analysis of Furnace Gases. il. A.I.M. '83, 1,10
- 2 Turner E. Papers, 8. unb. 1. Detection of Boracic Acid in Minerals by the Blowpipe. '26, 20; Detection of Lithia in Minerals by the Blowpipe. '26, 15
- 3 Turrell E. Improved Muffles, pl. 12 figs. 8. unb. '08, 1,15
- 4 Wait C. E. Note on a Cupel Machine. il. A. I. M. '86, 10
- 5 Wehrle A. Lehrbuch der Probier- und Huetttenkunde. 2 vol. in 1. 1115pp. 8. hcf. 44, G. 2, no Atlas, 7,75
- 6 Wohler F. Mineral Analysis. il. 1871, new, 2,40
- 7 " Inorganic Chemistry, illustrating Elementary Composition of Mineral Substances. 247pp. '54, 2,100

Original Description of New Species.

- (See also Papers from Am. Jour. of Science and Arts.)
- 72410 Berthier. Haidingerite, new species. 8. unb. '28, 1,15
- 1 Bertrand et Damour. Nouveau Mineral des Environs de Nantou (Bertrandite etc.). il. st. F. '83, 1,20
- 2 Berzelius J. J. Papers, 8. unb. 1. Two new Minerals & New Localities of Minerals. il. '25, 20; Thorite. '29, 15
- 3 Blake J. Roscoelite, a Vanadium Mica. 8. st. '76, 1,15
- 4 Blum. Leonhardite, new species. 8. unb. '44, 1,15
- 5 Boussingault J. B. Analysis of a new Mineral found in the Paramo River. S. Am. 8. unb. 1832, 1,15
- 6 Bowen. Analysis of Sillimanite. P. Ac. J. '24, 25
- 7 Brewster D. Papers, 8. unb. 1. Withamite from Glencoe. il. '25, 20; Gmelinite. il. '25, 20; Levynite. il. '25, 15
- 8 " & Turner. Ozahverite, from Iceland. il. 8. unb. '27, 1,25
- 9 Brezina A. Herregrundite. 23pp. 5 il. 8. unb. G. '79, 1,30
- 72420 Connell. Sulphatochloride of Copper. 8. unb. '47, 1,15
- 1 Cooke J. P. Papers, 8. unb. '75, 1. Melanosiderite, new Species from Mineral Hill. Delaware Co. Pa. '16; Two new Varieties of Vermiculites. 20
- 2 Cross & Eakins. On Ptilolite. 8. p. or unb. '86, 1,15
- 3 Damour & Rath. Ueber Trippkalt. 3 il. 8. p. '80 G. 1,20
- 4 DelRio. Analysis of Bi-seleniuret of Zinc and Sulphuret of Mercury from Calebras, Mex. 8. unb. '28, 1,25
- 5 Description of New Minerals from Edinburgh Journal of Science, ed. by D. Brewster. 8. unb. 1. Hyalosiderite; Hopeite; Chondrite; Somervilleite; Babingtonite. il. '24, 20; Sillimanite; Baryto-Calcite; New Lead Ore etc. il. '24, 15; Roselite; Columbite; Brochantite; Fluellite etc. il. '25, 15; Axotomus Arsenical-pyrites; Prismatoid Copper Glance; Fergusonite; Brookite etc. il. '25, 15; Uran-bloom; Comptonite etc. il. '26, 10; Gay-Lussite. '26, 10; Thenardite, Halloysite. '27, 10; Pyrochlore etc. '27, 15; Karpohosiderite; Mesitine Spar, Tautolite etc. '28, 15
- 6 Dufour. Hydrate of Silica & Alumina. 8. unb. '18, 1,10
- 7 Flight W. Evigtokite and Liskeardite. 8. p. '85, 1,20
- 8 Foote A. E. Zonochlorite etc. il. 8. p. '73, 1,10
- 9 Goldsmith E. Papers, P. Ac. Trautwineite. '73, 20; Stibioferrite from Cal. '74, 20; Boussingaultite from Cal. '76, 15; Sonomaite. '76, 15; Hexagonite. '76, 15; Halloysite from Ind. '76, 15; Stibianite. '78, 15
- 72430 Haidinger W. Papers, 8. unb. 1. Euchroite. '25, 15; Isopyre with Turner's Chem. Exam. '27, 30; Berthierite. '27, 10; Sternbergite. il. '27, 25; Herderite. il. '28, 25
- 1 " & Turner. Papers, 8. unb. 1. Two newly determined Species of Gypsum-haloids of Mohs' Syst. il. '24, 20; Edingtonite. il. '25, 20
- 2 Hermann. Pyrophillite, a new Mineral. 8. unb. '30, 1,10
- 3 Hidden W. E. On Edisonite. il. 8. p. or unb. '88, 1,15
- 4 Hope T. C. Account of a Mineral from Strontian and Peculiar Species of Earth it contains. 39pp. 4to. cf. 1793, 3, rare and celebrated work, 1,50
- 5 How. Mordenite from Nova Scotia. 8. p. n. d. 1,25
- 6 Keating W. H. Jeffersonite. P. Ac. J. 1822, 20
- 7 Kinch & Butler. New Var. of Mineral from Cornwall: Crystallographical Characters by Miers. 8. p. '86, 1,20
- 8 Kobel F. v. Descriptions of new Species. 8. unb. G. 1. Stylotop, Jollyt etc. '65, 25; Klipsteinit. '65, 25; Rabdonit. '70, 25; Guembelit. '70, 25; Monzonit etc. '71, 20
- 9 Koenig G. A. Papers, P. Ac. Hydrotitanite. '76, 10; Proteromericulite. '77, 20; Leidytite and its Association with Grossularite, Zoisite & Heulandite. '78, 20; Preliminary Notice of a new Species from Franklin, N.J. (Bementite.) '87, 15; Alaskalite. A. P. '81, 20
- 72440 Lea. Lesleyite & Pattersonite, Chester Co. Pa. P. Ac. '67, 15
- 1 Levy A. New Mineral Species (Mohsite). il. 8. unb. '27, 1,10
- 2 Lewis H. C. Papers, 8. unb. 1. Siderophyllite. '80, 10; Philadelphiaite. 16pp. il. P. Ac. '80, 15; Phytocollite. '82, 15; Empholite. '83, 10; Aimaifite etc. '84, 10; Rinkite. '84, 10
- 3 Locke J. M. Gibsonite or Uintahite. A.I.M. '87, 10
- 4 Nordenskiöld. Papers, 8. unb. 1. Sordawallite from Finland. '23, 20; Phenakite from the Ural. il. '34, 15
- 5 Oxaheverite, a new Mineral. 8. unb. '27, 1,10
- 6 Polykrase & Malakone, new species. 8. unb. '45, 1,10
- 7 Rand T. D. Ivigtite in Cryolite. P. Ac. '68, 10
- 8 Renwick J. New Mineral from Andover Furnace, Sussex Co. N. J. N. Y. Lyc. 1824, 20
- 9 Riott E. N. Stetefeldite, a new Mineral. B. '67, 10
- 72450 Rose G. Papers, 8. unb. 1. Epistilbite, new Mineral Species of Zeolite Family. 7 il. '26, 20; Zinkenite. il. '27, 20; Rhodizite. '35, 15; Rhodizite from Russia. '37, 15
- 1 Rudler F. W. Iodobromite. 8. unb. 1879, 1,15
- 2 Scheerer. Woehlerite, new species. 8. unb. '44, 1,15
- 3 Smith J. L. Rogersite from N. C. P. Ac. '76, 15
- 4 Steinmann J. On Kakoxene. 8. unb. 1826, 1,15
- 5 Stroem P. Achmite from Norway. 8. unb. '23, 1,10
- 6 Traill T. S. Barystrontianite. 8. unb. 1819, 1,10
- 7 Tripe, Brewster et al. Haytorite. il. 8. unb. '27, 1,20
- 8 Turner E. Haidingerite, new species. 8. unb. '27, 1,15

GEMS AND ORNAMENTAL STONES.

- 71890 Anderson J. Strata at the Diamond Mines of Mal-livully. 8. unb. 1820, 1. .15
- 1 Babinet. Diamond & Precious Stones. 31pp. Sm. '70, .15
- 2 Bail V. Papers, 8. p. 1. Occurrence and Distribution of Diamonds in India. 39pp. '80, .50; Records as to the Discovery of a Diamond in Ireland, 1816. '88, .25; Newly discovered Sapphire Mines in the Himalayas. '85, .25
- 3 Barcena M. Mexican Onyx. 8. p. 1876, 1. .15
- 4 Beudant J.S. Opals of Hungary. 19pp. 8. unb. '22, 1. .25
- 5 Blake W.P. Red Sapphire etc. A. A. S. 1852, .10
- 6 Blondel S. Jade, History etc. 17pp. Sm. '76, .20
- 7 Bournon Count de. Catalogue of Diamonds in the Collection of Sir A. Hume. 62pp. table of crystalline forms, 4 pl. 60 fig. 4to. bds. 1815, 2. .200
- 8 Bowdich. Aggr. Beads of Africa. 8. unb. '19, 1. .20
- 9 Brard C. P. Traite des Pierres Precieuses, des Porphyres, Granits etc. 592pp. 8 pl. 8. hcf. 1808, F. 2. .350
- 71900 Brazilian Diamonds in Matrix etc. 8. unb. '45, 1. .10
- 1 Breton P. Animal & Min. Products of Ramgur, etc., India (Diamond Mines etc.). 28pp. 8. unb. 1826, 1. .50
- 2 Brewster D. Papers, 8. unb. 1. Singular Structure in a Diamond. '20, .15; New Fluid in Sapphire. '27, .20; Origin and Structure of the Diamond. il. '35, .15; Cause of the Colors in Precious Opal. '45, .15
- 3 Cadell W. A. Manufact. of Mosaic at Rome & Hist. of Antique Marbles, Alabasters etc. 8. unb. 1820, 1. .15
- 4 Castellani A. Gems. 247pp. 1871, new. .175
- 5 Church. Cat. of Collect. of Precious Stones. p. u. d. 1. .15
- 6 Clarke & Diller. Turquois from New Mex. 8. st. '86, 1. .15
- 7 Cross. Topaz & Garnet in Rhyolite. S. p. or unb. '86, 1. .15
- 8 Davy Sir H. Combustion of Diamond. 8. unb. '14, 1. .15
- 9 Derby. Diamantiferous Region of Parana. A. P. '79, .10
- 71910 Diamond. Occurrence of in Siberia. S. unb. '28, 1. .15
- 1 Diamonds, etc. Occurrence of in Borneo. S. unb. '42, 1. .15
- 2 Discovery of Diamonds in Ural Mts. 8. unb. '31, 1. .20
- 3 Douault-Wieland. Artificial Gems. 8. unb. '20, 1. .15
- 4 Effect of Heat on Gems etc. 8. unb. 1800, 1. .25
- 5 Emanuel H. Diamonds and Precious Stones. 288pp. 6 pl. 67 il. 1873, new. .150
- 6 Feuchtwanger. Treatise on Gems. 178pp. il. S. '38, 2. .200
- 7 Foote A.E. Opal Mines, Queretaro. Mex. P. Ac. '86, .10
- 8 "Gems & Ornamental Stones of U. S. 4to. unb. '86, 1. .10
- 9 French Crown Jewels; Diamonds, Pearls and Precious Stones. Catalogue of. 46pp. 4to. p. 1887, 1. .20
- 71920 Fouque et Levy. Les Roches accompagnant et contenant le Diamant dans l'Afrique. 2 pl. il. S. p. '79, F. 1. .75
- 1 Fuchs. Opal & Amorphism of Solid Bodies. S. unb. '35, 1. .25
- 2 Gardner G. Travels in Brazil. 446pp. map, pl. '49, 2. full account of Gold & Diamond Districts, etc., .250
- 3 Goebellus S. De Succino. 68pp. st. 1558, L. 1. rare, 2.00
- 4 Goepfert Dr. Pflanzenachtliche Einschliesse in den Chalcedonen. 40pp. pl. 7 fig. 8. unb. '50, G. 1. .75
- 5 "u. Berendt. Der Bernstein u. die in ihm befindlichen Pflanzenreste der Vorwelt. 128pp. 7 pl. 278 fig. (many col.) folio, p. 1845, G. 1. .400
- 6 Groth P. Edelsteinkunde. 165pp. col. pl. S. '87, G. new. 1.20
- 7 Guyton C. Papers, 8. unb. 1. Conversion of Soft Iron into Cast Steel by means of the Diamond. 1799, .20; Combustion of the Diamond. 20pp. 1799, .25; Color of Lapis Lazuli. 1800, .15; Sculptured Head in Flint with a Covering in Chalcedony. pl. 1806, .25
- 8 Hamilton. Diamond Mine of Panna. 8. unb. '19, 1. .15
- 9 Hamlin A.C. Papers, A.A.S. Gems of the United States. 1870, .20; Properties of the Diamond. 1874, .10
- 71930 Hannay. Artificial Format. of Diamond. R.S. '80, .20
- 1 Hartmann P. J. Succini Prussici Physica et Civilis Historia. 291pp. 4 pl. p. 1677, L. 3. .100
- 2 Helm O. Mikroskopische Beschaffenheit u. Schwellf-halt des Bernsteins. 19pp. 8. p. G. 1878, 1. .75
- 3 "Einschliesse im Bernstein etc. 14pp. 4 il. 8. p. 1. .75
- 4 Herapath. Combustion of Diamond. il. 8. unb. '30, 1. .15
- 5 Hertz B. Catalogue of Collection of Pearls and Precious Stones formed by H. P. Hope. 118pp. 42 pl. 415 fig. 4to. London 1839, large paper ed. 1. rare, .1500
- 6 Howgate Artificial Precious Stones. 8. unb. '62, 1. .20
- 7 Jameson R. Speculations in regard to the Formation of Opal, Woodstone & Diamond. 8. unb. 1823, 1. .25
- 8 Jeffries D. Treatise on Diamonds and Pearls. 186pp. 25 pl. & tables, 128 fig. 8. cf. 2d ed. London 1751, 2. 6.00; or 4th ed. 132pp. 30 pl. 127 fig. n. d. 1. pub. at 5.00, .200
- 9 Keller H.A. Titaniferous Garnet. P. Ac. '82, .10
- 71940 King G.W. Natural History of Gems or Decorative Stones. 389pp. pl. London 1867, new. .250
- 1 Kluge K. E. Handbuch der Edelsteinkunde. 579pp. 15 pl. 201 fig. 8. hmoor. 1860, G. 2. .200
- 2 Kunz G. F. Papers, 8. p. or unb. 1. Am. Gems and Precious Stones. 18pp. '83, .10; Topaz & Assoc. Minerals from Stoneham, Me. '84, .10; White Garnet, from Wake-field, Can., Tourmaline & Assoc. Minerals of Auburn, Me., etc. '84, .10; Precious Stones. 60pp. '85, .10; Mummy Eyes for Jewelry. '85, .10; Precious Stones. '86, .10; New Artificial Rubies. 5 il. '86, .10; Gems of the Nat. Museum. '86, .10; Beryl & Garnet from Auburn, Me. Collection of Rough Diamonds etc. 22pp. il. '86, .10; Large Garnet from N.Y. Isl. il. '86, .10; North Carolina Diamond. il. '87, .10; Precious Stones in the U. S. col. pl. 21 fig. 21 il. '87, .20; Precious Stones in the last Decade. 17pp. '87, .15; Diamond and Precious Stones. 18 il. '87, .25; Diamonds in Meteorites. '88, .10
- 3 Lagrange. Analysis of Turquoise. 8. unb. 1807, 1. .15
- 4 Lea I. Papers, P. Ac. Microscopic Crystals in Gems etc. '69, .10; Same, Further Notes. '69, .15; Further Notes on Inclusions in Gems etc. pl. 27 fig. '76, .15
- 5 Leidy. Citrine or Yellow Quartz. P. Ac. '78, .10
- 6 Lewis H.C. Gems from Himalaya Mts. 8. unb. '84, 1. .10
- 7 Lindley A.F. Adamantia. The Truth about the So. Afri-can Diamond Fields. 434pp. 8 maps, col. pl. 8. '73, 1. .75
- 8 MacCulloch J. Coloring Agates. 8. unb. 1819, 1. .10
- 9 Morris J. Gems and Precious Stones of Great Britain. Text, col. pl. 15 fig. 8. unb. 1868, 1. .50
- 71950 Murray J. The Diamond including its Economical and Political History. 81pp. 2 pl. 18 fig. 1839, 1. .75
- 1 Noeggerath. Die Kunst Onyx, Carneole, Chalcedone etc. zu faerben. 18pp. 8. unb. '45, G. 1. .30
- 2 Our Great Diamonds. 8. unb. 1868, 1. .20
- 3 Pepps W.H. On Gems. 8. unb. 1803, 1. .20
- 4 Petzholdt. Formation of the Diamond. 8. unb. '43, 1. .20
- 5 Precious Stones mentioned in the Bible. Plate with 19 fig. col. by hand and named. 8. 1. .25
- 6 Richmond J.F. Diamonds, Unpolished and Polished. 249pp. 4 pl. 1873, 1. .100
- 7 Roset H. Jewelry and Precious Stones; History & Description of the largest Diamonds etc. 41pp. S. p. '56, 1. .10
- 8 Rudler F.W. Papers, 8. unb. 1. Jade & Kindred Stones. 15pp. pl. 7 fig. '79, .35; Artificial Diamonds. '80, .25
- 9 Schweigger-Seidel. Color of Lapis Lazuli. S. unb. '30, 1. .15
- 71960 Silliman B. Turquoise of New Mex. il. A.A.S. '81, .15
- 1 Smith J.L. Magnesian Opal from Asia. A.A.S. '52, .10
- 2 Squier E.G. Collection of Chalchihuitls from Central Am. 20pp. 19 il. N.Y. Lyc. 1869, .35
- 3 Stoliczka F. Jade in the Karakash Valley on the Southern Borders of Turkestan. 8. unb. 1874, 1. .50
- 4 Streeter E. W. Precious Stones and Gems. 306pp. 13 pl. (mostly col.) il. 1882, 1. .350
- 5 Tennant Prof. Notes on Diamonds from the Cape of Good Hope. 41 l. 8. unb. 1875, 1. .15
- 6 Tiffany & Co. Collection of Rough Diamonds and Diamond-bearing Rocks. 23pp. pl. 16 fig. 8. p. '85, 1. .15
- 7 Vauquelin C. Papers, 8. unb. 1. Analysis of Peru Emerald. 1798, .15; Analysis of Spinell Ruby. 1799, .15
- 8 Westropp H.M. Manual of Precious Stones and Gems. 181pp. pl. il. 1874, 1. .60
- 9 Williams G.F. Diamond Mines of South Africa. 26pp. 8 il. A. I. M. 1886, .20
- 71970 "Emeralds & Beryls. 22pp. il. R. S. '77, .35
- 1 Zaddach E. J. Bernsteinlager in Westpreussen u. Pommern etc. 82pp. col. pl. il. 4to. unb. '69, G. 1. .65
- 2 "Bernstein u. Ausdehnung des Tertiargebirges in W. Preussen u. Pommern. 82pp. pl. il. 4to. '69, 1. .150
- Papers from Am. Jour. of Science and Arts.
- 71980 Alger. Rutillated Quartz Crystals from Vt. 291l. '50, .15
- 1 Blake W.P. Chalchihuitl of the Mexicans. 1858, .25
- 2 Chancourtois. Origin of the Diamond. '66, .10
- 3 Coloring Matter etc. of Brazilian Topaz. 1824, .10
- 4 Damour. Oriental Jade & Tremolite. 1846, .10
- 5 Diamond (The) Hist. of Cutting etc. 1830, .10
- 6 Diamonds of the Ural etc. (Murchinson.) 1846, .10
- 7 Dufrenoy M. Compact Diamond from Brazil. '49, .10
- 8 Emerald Mines of Egypt. A. J. 1820, .10
- 9 Guemelt T. Structure of the Agate. 1854, .10
- 71990 Hare et al. Papers on Fusion of Carbon. 16pp. '26, .15
- 1 Hitchcock E. Topaz in White Mts. N.H. '31, .10
- 2 Hubbard O.P. Beryls in Grafton, N.H. il. '52, .10
- 3 Hunt T.S. Nature of Jade etc. 1863, .10
- 4 Johnston. New Var. of Beryl, Haddam, Conn. '41, .10
- 5 Lee C. A. Remarks on Gems especially on some of those found in the U. S. 1840, .15
- 6 Mallet J.W. Anal. of Beryl from Goshen, Mass. '54, .10
- 7 Maskelyne. On the Koh-i-noor Diamond. '56, .10
- 8 Piddington. Great Diamond of the Nizzam. il. '50, .15
- 9 Rogers R.E. & W.B. Oxidation of the Diamond in the Liquid Way. 1848, .10
- 72000 Seybert H. Analysis of Magnesian Garnet from Haddam, and Boric Acid in Tourmalines. '23, .10
- 1 Shepard C. U. Second Locality of Topaz in Conn. and of Phenakite in Mass. 1838, .10
- 2 Tennant Prof. Koh-i-noor Diamond. il. '54, .10
- 3 Turpin M. Cause of Red Color of Agates. 1839, .10

MISCELLANEOUS MINERALOGY.

(See also, Mineralogy, Mining, Iron, Gold and Silver, etc.)
IRON.

120 Andrews T. Effect of Temperature on Strength of Railway Axles. 33pp. 3 pl. 15 fig. 6 il. 8. p. 1886, 1, .50
Barus & Strouhal. Papers. 8. unib. 1. Time of Exposure, Temper. Value and Color in Oxide Films of Steel. il. 86, 10; Electric Resistance and Density when varying with the Temper of Steel. 20pp. il. 86, 10; Effect of Sudden Cooling of Steel and Glass. 36pp. 13 il. 87, 10
Cowan. Carron Iron Works, Scotland. pl. 8. p. 86, 1, .25
Hadfield. Manganese Steel. 129pp. 2 pl. 36 il. 8. p. 88, 1, .75
Hill A. J. Use of Cast Steel in Locomotive Engines. pl. 13 fig. 8. p. 1887, new, .20
Journal of Iron and Zinc, Jan. '54 to June '56, 135pp. 8. unib. 1, .50
Julien A. A. Papers. 8. unib. 1. Genesis of Crystalline Iron Ores. '82, 15; Variation of Decomposition in Iron Pyrites. 2 Parts. 140pp. 2 pl. '86 & '87, 75; Microscopical Structure of Iron Pyrites. '86, .25
Kennedy N. Bilbao Iron Works. 8. p. 1886, 1, .20
Longridge J. A. Further Investigations regard Wire-Gun Construction. 67pp. 26 il. 8. p. 1887, new, .30
Maitland. Treatment of Gun Steel. 129pp. 12 il. 8. p. '87, 1, .75
130 Salom P. G. Physical & Chem. Tests of Steel for Boiler & Ship Plate for U.S. Cruisers. 16pp. A.L.M. '84, 15
Savage H. Machinery for the new Steel Works at Terni. 17pp. 2 pl. 8 fig. il. 8. p. 1888, new, .30
Serivenor H. History of the Iron Trade from the earliest Records to the Present Period. 335pp. 8. 1854, 1, 1.50
Seyrig T. Iron Skeleton of Statue of Liberty, Bedloe's Isl., N.Y. Harbor. il. 8. p. 1887, new, .20
Thiery A. Applications du Fer aux Constructions de l'Artillerie. 2 vol. Text. 412pp. 5 pl. 4to. p. and folio Atlas of 9 double pl. p. 1840 & '41, F. 2, 1.50
Waddell J. A. L. General Specifications for Highway Bridges of Iron & Steel. 46pp. 8. p. 1887, 1, .25
Woehler A. Festigkeits Versuche ueber Eisen und Stahl. 17pp. 5 pl. 16 fig. il. folio, G. 1870, 3, .69

MINING.

1340 Bear Mountain R. R. Reports by E. F. Johnson & W. R. Casey and On Coal & Iron Ores of Bear Valley Coal Basin by J. Hall. 96pp. 2 sect. 8. 1845, 1, 1.50
Same. Act of Incorporation etc. 16pp. pl. 8. st. 74, 1, .35
Blake. Quicksilver Mine, Almaden, Cal. A.J. '54, .10
Clemson. The Hartz Mines etc. 26pp. pl. A.J. '31, .15
Coke E. B. Mining Legislation. 18pp. 8. p. 1870, 1, .25
Emerson R. On the Divining Rod. A. J. 1821, .10
Ferman. Salt Formation, Salina, N. J. A. J. '31, .15
Fox. Questions relative to Mineral Veins. A. J. '38, .10
Gibson. Salt Works, Zipaquera, Spain. A. J. '37, .15
Hare R. Papers. A. J. Ignition in Rock Blasting. '32, .15
Apparatus for blasting Rocks by means of Galvanic Ignition. 8. il. '34, .15
1350 Hawley. Almaden Quicksilver Mines. A. J. '68, .10
Hayden. Rock Salt etc. of the Holston, Va. A. J. '42, .15
Dria. Quicksilver Mines. Visit to. A. J. 1836, .15
Kennedy A. B. W. Use and Equipment of Engineering Laboratories. 156pp. pl. 40 il. 8. p. 1887, 1, .50
Le Conte J. Mineral Vein Formation. il. A. J. '83, .15
Le Play. Mining Industry of Spain. A. J. '35, .15
Mahlet al. Mining Appliances. Westphalia. 8. p. '88, 1, .10
Michigan Mining School, Houghton, Mich. 8. p. '87, 1, .10
Morgan. Galvanic Battery in Blasting. A. J. '40, .15
N.S. Wales. Department of Mines. Report '87. 216pp. 4 maps (2 col. of Diamond fields). pl. il. folio, p. 1, .75
1360 New Zealand. Reports of Mining Industries of 164pp. 2 pl. 9 fig. folio, p. 1888, 1, 1.00
Osborn H. S. Manual of Mineralia, Mines and Mining. 171 il. 8. new, last ed., 3.60
Owen R. Rock Salt at New Iberia, La. A. J. '66, .10
Scrap-Book of Newspaper Clippings in reference to Coal, Coal Oil, Iron etc. 2 vol. 260pp. 4to. hmo. 2, 5.00
Silliman B. Almaden Quicksilver Mines. A. J. '64, .10
Silliman B. (?) The Divining Rod. il. A. J. '26, .50
Whitney J. D. Changes in Mineral Veins. A. J. '55, .10

MISCELLANEOUS MINERALOGY.

1370 Bailey J. W. Common Blowpipe. il. A. J. '37, .10
Beck L. C. Oxy-chlorine Blowpipe. A. J. '29, .10
Berthier M. P. Anal. of N. J. Zinc Ores. A. J. '20, .15
Brongiart. Conversion of Felspar of Primitive Rocks into Porcelain Clay etc. 8. unib. 1841, 1, .20
Chandler C. T. Tin Ore, Durango, Mex. A. J. '65, .10
Elliot & Storer. Arsenic as an Impurity of Metallic Zinc. 15pp. A. J. 1861, .10
Flight W. Composition of Alloys etc. 8. p. 1882, 1, .20
Green J. A new Blowpipe. il. A. J. 1822, .15
Hare's & Brook's Blowpipes compared. pl. A. J. '21, .15
Hitchcock E. Tin in Mass. A. J. 1829, .35
1380 Hjelm J. Method of Purifying Lead from Gold and

Silver for Assaying. 8. unib. 1798, 1, .15
1 Hubbard A. O. Lead Veins of Mass. A. J. '25, .10
2 Kersten. Composition of Brown Lead Ore. A. J. '32, .20
3 Lee C. A. Ancram Lead Mine. A. J. 1824, .10
4 McCreath A. S. Report of Progress in Laboratory of Penna. Survey. Analyses of Coals, Iron Ores. Limestones, etc. 3 vol. 790pp. map. pl. il. 8. '75 to '81, 1, .75
5 Mallet J. W. Analysis of Tin Pyrites. A. J. 1854, .15
6 Mather. Cupellation with the Blowpipe. A. J. '47, .10
7 Phillips J. A. The Alkaline and Boracic Lakes of California. 8. unib. 1877, 1, .50
8 Rath G. vom. Einige Geologische Wahrnehmungen in Griechenland (chiefly on Min'ls). 49pp. il. 8. p. '87, G. 1, .35
9 Rudler. Agates & Agate Working. pl. 8. unib. '77, 1, .50
73190 Silliman B. Papers. A. J. Compound Blowpipe. '18, .10; Argentiferous Galena from Huntington and Lead Ore from Bethlehem, Conn. etc. '21, .15
1 Streeter E. W. The Great Diamonds of the World, their Hist. and Romance. 321pp. 8. 1882, new, 1.50
2 Torrey J. Galena from Lebanon Co. Pa. A. J. '63, .10
3 Van Beek A. Supposed Property of Tin of Preserving Iron from Corrosion in Sea Water. 8. unib. '37, 1, .20
4 Velasquez de Leon D. M. La Ramirita, Nueva Especie Mineral. 32pp. port. pl. 8. p. '85, Spanish, 1, .30
5 Wanklyn F. L. Iron and Brass Foundations, Point St. Charles Works, Grand Trunk R. R. of Can. pl. 8. p. '87, 1, .20
6 Wurtz H. On the Mouth Blowpipe. 1859, .15

Original Descriptions of New Species from Am. Jour. of Science and Arts.

73200 Arents A. Partzite, a new Mineral. 1867, .10
1 Booth J. C. Remingtonite, a new Mineral. 1852, .15
2 Boussingault. Gay-Lussite. 1827, .15
3 Bowen G. T. Papers. Analysis and Description of Silimanite. '24, 10; New Variety of Orthite etc. '25, .10
4 Breithaupt A. Papers. Pinguite, a new argillaceous mineral. '31, 10; Chloanthite etc. '46, .10
5 Brush G. J. Papers. Pachnolite. '64, 10; Sussexite new Borate from N. J. '68, 20; Durangite. '69, 10; Hortonsolite, new member of the Chrysolite Group. 3 il. '69, .10
6 Cook J. P. Cryophyllite. il. 1867, .15
7 Dana. Supposed new Mineral at Bolton, Mass. '39, 10
8 Faber W. L. Carolite, a new Mineral. 1852, .10
9 Field F. Papers. '59. New Sulphid of Copper and Lead. 10; Guayacanite, new species from Chili. '59, .10
73210 Greg R. P. Conistonite, a new Species. il. '51, .10
1 Haidinger. Papers. Hauerite. '47, 10; Brandisite. '48, .10
2 Hayden H. H. Necronite (supposed new sp.). '19, .10
3 Hayes A. A. Chem. Analysis of Danalite. 1853, .10
4 Hermann M. Voelknerite, a new Mineral. '49, .10
5 How. Silicoborocalcite, a new Mineral. '68, .10
6 Hunt T. S. Papers. New Titaniferous Mineral. '46, 15; Chem. Examination of Algerite. '49, .10
7 Jackson C. T. Beaumontite, a new Mineral. 1839, .10
8 Jackson & Hayes. Lederite, a new species. il. '34, .15
9 Kerndt M. Muramontite, a new Mineral. '49, .10
73220 Knowlton. Cytrolite, a new Mineral. '67, .10
1 Koscharow. Bagrationite, new Ural Mineral. '48, .10
2 Le Conte J. L. Coracite, new Uranium Ore. '47, .15
3 Mayer. Thomaite, a new Species. 1845, .10
4 Monticelli & Covelli. New Vesuvian Minerals (Humboldtite, Zurlite, Davina etc.). 28pp. 34 il. '26, .75
5 Moore G. E. Brushite, new Mineral. 1865, .10
6 Nordenskiöld G. Papers. Sodawalite. '26, 10; Diphanite, a new Species. '47, .10
7 Riote E. Huebnerite, a new Mineral. '67, .10
8 Salvétat M. Randalite from Algiers. '49, .10
9 Seybert H. Analysis of Maculireite. 1822, .20
72230 Shepard C. U. Papers. Microlite. '55, 15; Edwardsite. '37, 10; Eremite. il. '37, 10; Warwickite. '38, 10; Calstronbarite. '38, 15; Danburite. '39, 10; Analysis of Warwickite. '39, 10; Supposed new Mineral Species (Lederite). '40, 10; Washingtonite. '42, 20; Williamsite from Lancaster Co. Pa. '48, 10; Dimagnetite. Jenkinsite. '52, 10; Five new Species: Xanthitane, Pyroclasilite, Glaubapatite etc. '56, 10; Aquacrepitite etc. '68, .15
1 Smith J. L. Papers. Two new Minerals (Medjidite and Liebigite). '48, 10; Liebigite. '51, .10
2 Sonden M. Brevicite, a new Mineral. 1836, .10
3 Taylor W. J. Papers. Tennantite and Buratite. '55, 10; Lecontite, a new Mineral. '58, .15
4 Teschemacher J. E. New Min. from the Azores. il. '47, 15
5 Thomson T. Emmonite, a new Species. 1837, .10
6 Torrey J. New Ore of Zinc. 1822, .15
7 Traill T. S. Stromnolite, a new Mineral. A. J. '20, .10
8 Volborth A. Volborthite, a new Mineral. 1839, .10
9 Wachmeister. Analysis of Hydromagnesite. '30, .10
73240 Whitney. Jacksonite, Chlorastrolite. 1848, .10
1 Wochler F. Papers. Two new Cobalt Minerals. '39, 10; Laurie, a new Mineral. '66, .10
2 Wolchonskoite, Wørthite, Pyragillite, etc. '34, .10
3 Wurtz H. Supposed new Mineral Species. 1850, .10

CRYSTALLOGRAPHY, ETC.

- 72010 Accum F. Elements of Crystallography. 459pp. 4 pl. 13 fig. 8. bds. London 1813, 1. 1.00; or 2. .75
- 1 Becquerel M. Papers. 8. unb. 1. Electricity disengaged in Cleavage of regularly crystallized Bodies. 28. 15; Chem. Effects of Electric Currents in producing Crystallization of Metallic Oxides etc. 29pp. il. 77. .35
- 2 Bertin. Idiocyclophanische Krystalle. 29pp. il. 8. unb. 79. 1. .25
- 3 Berzelius. Atrophy & Isomerism. 8. unb. 74. 1. .20
- 4 Beudant. Crystalline Form & Chem. Comp. 8. unb. 79. 1. 15
- 5 Bezold Dr. v. Mathematische Beziehungen zwischen Krystallogr. Grundgesetzen. 23pp. 8. unb. 763. G. 1. 25
- 6 Blake W. P. Instrument for Measuring Angle between Optic Axes etc. A.A.S. 751. .10
- 7 Brezina A. Crystallography. 34pp. 39 il. Sm. 72. .15
- 8 Brewster D. Papers. 8. unb. 1. Phenomena of Dichroism or Absorption of Light by Crystallized Bodies. il. 20. 15; Absorption of Light by doubly Refracting Crystals. 20. 15; Rhombohedral Ice Crystallization. il. 34. .15
- 9 Brooke H. J. Crystallography. 523pp. 391 il. 8. bds. 23. 2. 75
- 72020 " Papers. 8. unb. 1. Crystallization. 25. 10; Isomorphism. 31. 15; Further Remarks on Same. 71. 15
- 1 Bruegelmann. Krystallization. (No.) 43pp. 8. p. 84. 1. 20
- 2 Buee Abbe. Parallel of Rome de l'Isle's and Hauy's Theories of Crystallography. 25pp. 8. unb. 1804. 1. .35
- 3 Cloud Crystals: A Snow-flake Album, by a Lady. 158pp. 27pl. 189 fig. il. 4to. 1864. 1. 1864. 1. pub. at 3.00. 1.50
- 4 Craig. Angles of Minute Crystals. 8. unb. 35. 1. .20
- 5 Dana J. D. Papers. Homœomorphism of Mineral Species of the Trimeric Syst. 28pp. il. N.Y. Lyc. 54. 25; Metamorphism with reference to Statements of T.S. Hunt. B. 1874. .20
- 6 Daniell J. F. Theory of Spherical Atoms & its Relation to Specific Gravity of Minerals. 4 pl. 25 fig. 8. unb. 17. 1. 35
- 7 Frazer P. Crystallization. 9 il. 8. p. 1885. 1. .10
- 8 " Crystallization in Sculpture. A.P. 1877. .10
- 9 Glazebrook R. T. Plane Waves in a Biaxial Crystal. 91pp. 16 il. 4to. unb. 1879. 3. .50
- 72030 Granville. Methuon's Mem. on Crystallization. 8. unb. 77. 1. .10
- 1 Griffin. Crystallography. 516pp. il. 8. 74. 1. 1.00; or 2. 50
- 2 Gurney H. P. Crystallography. 128pp. 46 il. new. .35
- 3 Gutzeit T. Das Gesetz der Zwillingsbildungen am Stein. 32pp. 2 pl. 85 fig. 8. stitched. 1865. G. 1. .35
- 4 Hague & Iddings. Development of Crystallization in Igneous Rocks of Washoe. 44pp. 8. p. 35. new. .10
- 5 Hausmann. Metallurgic Crystall. 19pp. 8. unb. 21. 1. 20
- 6 Hauy Abbe. Traite de Crystallographie. 2 vol. Text. 1237pp. 8. & Atlas of 84 pl. 798 fig. hcf. 1822. F. 2. 3.00
- 7 " Tableau Comparatif des Resultats de la Crystallographie. 306pp. 4 pl. 69 fig. 8. hcf. 1809. F. 2. .75
- 8 " Papers. 8. unb. 1. Theory of Structure of Crystals. 63pp. 4 pl. 67 fig. 1798. 50; Short Method of Expressing the different Crystalline Forms. pl. 26 fig. 1798. .20
- 9 Hessel. Crystallization of Ice, etc. 8. unb. 32. 1. .20
- 72040 Hugo L. L'Equidomide et des Cristalloides Geometriques. 32pp. 2 pl. 35 fig. 8. p. 1875. F. 1. .50
- 1 Hunt R. Papers. 8. unb. 1. Influence of Magnetism and Voltaic Electricity on Crystallization etc. 27pp. 14 il. 46. 35; Science of a Snowflake. pl. 39 fig. 68. .35
- 2 Huntington. Crystallographic Notes. il. 8. p. 185. 1. 25
- 3 Johnson. Dimorphous Bodies. 53pp. 8. unb. 38. 1. .90
- 4 Jordan J. B. Crystallography. 48pp. 9 pl. 1873. 1. .50
- 5 Kobell F. v. Polarisationbilder an Zwillingen Zweiaxiger Krystalle. 10 il. 8. unb. 1881. G. 1. .15
- 6 Kopp H. Einleitung in die Krystallographie. 362pp. 8. hrd. 1862. G. 2. no Atlas. .50
- 7 Levy A. Papers. 8. unb. 1. Determ. of Secondary Faces in Crystals. il. 22. 15; Modes of Notation of Weiss, Mohs and Hauy. 24pp. 4 il. 25. .35
- 8 Lloyd H. Phenomena of Light in passing through Axes of biaxial Crystals. 8. unb. 1833. 1. .20
- 9 Mairan. La Glace. 443pp. 6 pl. cf. 1749. F. 2. .75
- 72050 Meigs J. A. Relation of Atomic Heat to Crystalline Form. 32pp. 4to. stitched. 1855. 1. .50
- 1 Miller. Tract on Crystallography. 92pp. il. 8. 63. 1. 1.00
- 2 Milne. Notes on Crystallography. 78pp. 25 il. 8. 79. 1. 75
- 3 Mitscherlich E. Production of Crystallized Minerals by Heat. 8. unb. 1825. 1. .15
- 4 Mohs. Crystallographic Discoveries. 16pp. 8. unb. 23. 1. 15
- 5 Naumann. Krystallographie. 308pp. 26 pl. 8. p. G. 54. 3. 50
- 6 Ogden H. Saline Crystallization. 8. unb. 32. 1. .25
- 7 Pfaff. Waermeleitung der Krystalle. 8. unb. 60. 1. .20
- 8 Pluecker M. Repulsion of the Optic Axes of Crystals by the Poles of a Magnet. 24pp. 8. unb. 1849. 1. .35
- 9 Regnault M. V. Crystallography. 70pp. 108 il. 8. 48. 1. 1.00
- 72060 Rome de l'Isle. Crystallographie. Vol. 4. (Atlas.) 128pp. 12 pl. 494 fig. oblong folio. bds. 1783. F. 2. 1.00
- 1 Rose. Light evolved during Crystalliza. 8. unb. 35. 1. 15
- 2 Rudberg M. Dispersion of Light and Refraction of

- colored Rays in Crystals. 30pp. il. 8. unb. 27 & 31. 1. 50
- 3 Ruskin J. Ethics of the Dust. Ten Lectures on the Elements of Crystallization. 251pp. 8. 1881. 1. 1.00
- 4 Sadebeck A. Angewandte Krystallographie, mit Anhang ueber Zonenlehre. 299pp. 23 pl. 257 fig. 8. p. 76. G. 2. 1.75
- 5 Savart F. Elasticity of Bodies which crystallize regularly. 30pp. 2 pl. 95 fig. 8. unb. 1837. 1. .35
- 6 Schumacher G. F. Die Krystallisation des Eises. 170pp. 5 pl. 233 fig. 8. bds. 1844. G. 1. .15
- 7 Senarmont H. de. Optical Characters of double Refraction in Isomorphous Substances. 38pp. pl. 8. unb. 53. 1. 50
- 8 Soechting & Seyffert. In anderen Krystallen eingeschlossene Krystalle. 22pp. 8. unb. 1853. G. 1. .25
- 9 Townsend. Crystallization of Snow. 8 il. 8. unb. 181. 1. 25
- 72070 Ure A. On Saline Crystallization. 8. unb. 18. 1. 10
- 1 Weiss. Different Syst. of Crystallization. 8. unb. 24. 1. 10
- 2 Whewell W. Papers. 8. unb. 1. Calculating Angles made by Planes of Crystals etc. 25. 10; Notation in the Analysis of Crystalline Form. il. 27. .35
- 3 " On Isomorphism. 8. unb. 1831. 1. .20
- 4 " Remarks on above, by H. J. Brooke. 8. unb. 32. 1. 15

Papers from Am. Jour. of Science and Arts

- 72080 Baudrimont. Struct. etc. of Crystall. Bodies. 748. 1. 10
- 1 Blake J. M. Measuring Angles of Crystals. 766. .15
- 2 Casamajor P. Measuring Angles of Crystals. 757. .15
- 3 Dana J. D. Papers. New Syst. of Crystallographic Symbols. pl. 7 fig. 35. 20; Formation of Twin Crystals. 2pp. 36. 20; Drawing of Figures of Crystals. 21pp. 14 il. 38. 20; Certain Laws of Cohesive Attraction. 21pp. 20 il. 47. 15; Law of Cohesive Attraction as exemplified in a Crystal of Snow. il. 48. 10; Isomorphism & Atomic Volume of some Minerals. 26pp. 750. 15; Note on Heteronomic Isomorphism. 751. 10; Lettering Figures of Crystals. 8 il. 52. 25; Homœomorphism of Mineral Species of the Trimeric System. 20pp. il. 54. 20; Crystallogenic and Crystallographic Contributions. 32pp. il. 67. .25
- 4 Des Cloizeaux. Action of Heat on Optical Properties of Crystals. 1867. .15
- 5 Green J. Papers. Crystallization of Snow. il. 20. 15
- 6 Case of Instantaneous Crystallization. 21. .15
- 6 Kobell F. v. Papers. The Stauroscope. il. 55. 10; Combination of Stauroscope & Microscope. il. 55. 10
- 7 " Series of Isomorphous and Homœomorphous Forms. Notice of by Dana. 54. .10
- 8 Pluecker J. Magnetic Induction of Crystals. 358. .10
- 9 Rood O. N. Abstract of Kobell's Stauroscopic Obs. & Stauroscopic & other Experiments. il. 1859. .10
- 72090 Scheerer T. Papers. Peculiar Isomorphism that plays an important Part in the Min. Kingdom. 40pp. 48. 15; Polymeric Isomorphism. (Abst.) 62. .15

BIOGRAPHY.

- 72100 Alger F. Notice of Death of, by Jackson. B. 66. 15
- 2 Bergmann O. T. Life & Writings of, 8. unb. 1801. 1. 15
- 3 Berzelius J. J. Obituary Notice of, A.J. 1848. .15
- 4 Bruce A. Biographical Notice of, A.J. 1819. .15
- 5 Cheever B. W. Biographical Notice of, A.I.M. '88. .10
- 6 Chilton G. Obituary of, A. J. 1837. .10
- 7 Clark E. D. Life and Remains of, by W. Otter. 2 vol. 392pp. port. 8. cf. gilt. London 1825, fine library copy. 75; or, hcf. 1. 50; or bds. 2. 40; or, Am. ed. in 1 vol. 528pp. 8. bds. 1827. 2. .35
- 8 Cleaveland P. Life and Character of, by L. Woods. 80pp. port. 1860. 2. small edition, rare. .75
- 9 Corvett M. Biographical Notice of, A.I.M. '87. .10
- 72110 Dolomieu. Life & Writings of, 8. unb. 1817. 1. 15
- 1 Fuchs J. N. Biography of, by Kobell. 16pp. A.J. 1850. .15
- 2 Gruner L. Biographical Notice of, A.I.M. '88. .10
- 3 Hauy R. J. Biographical Notice of, 8. unb. 1826. 1. 15
- 4 " Memoir of, by Cuvier. 26pp. 8. unb. 1829. 1. .30
- 5 Heinrich O. J. Biographical Notice of, A.I.M. '86. .10
- 6 Hitchcock E. Obituary of, A. J. 1864. .10
- 7 Jackson C. T. Obituary Notice of, by Bouve. B. 89. 15
- 8 Mohs F. Biographical Sketch of, 8. unb. 1829. 1. .25
- 9 Rose H. Biography of, 26pp. A. J. 1864. .10
- 72120 Silliman B. Life of, by G. P. Fisher. 2 vol. 840pp. port. pl. 1866. 1. 2.00
- 1 " B. J. Biogr. Notice of, by Eggleston. A.I.M. '85. .10
- 2 Smith J. L. Life & Scientific Work of, with List of his published Memoirs, by B. Silliman. 32pp. 8. p. 784. 1. 25
- 3 Steffens. Werner and Freiberg. 19pp. 8. unb. 742. 1. 20
- 4 Teschemacher J. E. Obituary of, A. J. 1854. .10
- 5 Thomas S. G. Biographical Notice of, A.I.M. '85. .10
- 6 Thompson C. O. Biographical Notice of, A.I.M. '85. .10
- 7 Torey J. Biogr. Notice of, by T. S. Hunt. B. 73. .15
- 8 Turner E. Biogr. Memoir of, 26pp. 8. unb. 37. 1. .25
- 9 Vanuxem L. Obituary Notice of, A. J. 1848. .10
- 72130 Vauquelin L. N. Eloge of, by Cuvier. 8. unb. 33. 1. 15
- 1 Wesky M. Erinnerung an, by Rath. 8. p. 78. G. 1. 15
- 2 Werner A. G. Eloge of, by Cuvier. 16pp. 8. unb. 21. 1. 15

North American Local Mineralogy.

(See also Mineralogy in general, Mining, etc.)

- Arizona. Hamilton P. Resources of Mineral Lands etc. 47 pp. map. 19 pl. 1884, 1. .75
- Hinton R. J. Handbook of: Its History, Mines etc. 62 pp. map. 27 pl. 1878, 2. .75
- Kunz G. F. Hollow Quartz from. pl. 8, p. '87, 1. .10
- Arkansas. Smith J. L. New Locality of Tetrahydrite, Tennantite & Nancrite, & Kellogg Mines. A. J. '67. .15
- California. Catalogues of State Museum. S. p. 1. Vol. 1, 35 pp. 1882, 2.00. Vol. 2, 220 pp. 1885, 1.50
- Dana J. D. Notes on Upper California. 18 pp. pl. il. A. J. 1849, 1. .15
- Goldsmith E. Blue Gravel of Cal. P. Ac. '74. .10
- Loew O. Geol. & Mineralogical Character of South-eastern Cal. & Adjacent Regions. 17 pp. il. W. 1876, 20. .10
- Lyman. Cinnabar Mines, Upper Cal. A. J. '48. .10
- Reports of the State Mineralogist. S. p. new. 1st 1880, 43 pp. cloth. very rare, 3.00. 2d 1880 to '82, 24 pp. map, 4 photos. 5.00; or without photos, cloth, 3.00; 3d 1883, 111 pp. map, 1.50. 4th '84, 410 pp. pl. 150. 5th '85, 255 pp. 5 pl. il. '85, 2.00; 6th '86 & '87, 2 Parts. 367 pp. 2 pl. 2 maps. (1 col.) il. 3.50; 8th 1888, 94 pp. 20 pl. il. 2.00
- Root E. W. Enargite from Cal. A. J. 1868. .10
- Canada. Baddeley Lt. Mineralogy, Geol. etc. of the Magdalen Isl. 37 pp. 2 maps, 8. unib. '23, 1. .50
- Bailey & Jack. Minerals and Woods of New Brunswick. 51 pp. p. 1876, 1. .20
- Bell R. Appetite in Canada. 8. unib. 1886, 1. .20
- Canada at the Universal Exhibition, 1855, contains Logan & Hunt. Sketch of Geol. & Cat. of Economical Minerals etc. 463 pp. map. 2 pl. 8. bnd. '56, 1. .50
- Chapman. Analyses of Can. Minerals. S. unib. '73, 1.20
- Dawson J. W. Papers. S. unib. 1. Graphite of Laurentian of A. J. 70, 10; 2. Phosphates of Canada. '78. .10
- Emmons E. Scientific Expedition to Nova Scotia: Mineral Localities etc. 25 pp. A. J. '36. .25
- Foote A. E. Spheue etc., Renfrew Co. P. Ac. '82, 10
- Gesner A. Geology and Mineralogy of Nova Scotia. 314 pp. col. map. 2 pl. 8. 1836, 2. rare. 2.50
- Harrington B. J. Notes on Canadian Minerals and Rocks. 1 pp. pl. 8. unib. 1875, 1. .35
- Hayes. Acadiolite of N.S. (Chabasite.) A. J. '43, 10
- Hoffmann C. Papers. S. unib. 1. Chem. Examination of Can. Rocks & Minerals. '76, 25; Canadian Apatite, '79, 25; Minerals of some of the Apatite-bearing Veins of Ottawa Co. 42 pp. 10, 50; Recent Analyses of Canadian Minerals etc. '81, 15; Analysis of Miscellaneous Minerals. 21 pp. '81, 25; Analysis of Samarskite and other Minerals. 16 pp. '83. .35
- How H. Papers. A. J. Faeolite & other Zeolites of Nova Scotia. '58, 10; Natro-boro-calcite and another Borate in the Gypsum of Nova Scotia. '61. .10
- Hunt T. S. Papers. S. unib. 1. Minerals of Laurentian Limestone; Petroleum in Can. etc. 11 pp. '66, '75; Apatite Deposits of Canada. A. L. M. 1884. .15
- Jackson & Alger. Mineralogy and Geology of Nova Scotia. 114 pp. col. map. 4 col. pl. 4to. unib. 1838, 1. 2.00
- Kinahan. Apatite of Buckingham. 8. unib. '86, 1. .15
- Kunz G. F. Native Antimony at Prince William, New Brunswick. 8. stitched, 1885. .10
- Logan & Hunt. Esquisse Geologique du Canada, et Catalogue des Mineraux Economiques. 190 pp. col. map. p. Paris 1855, F. 1. 1.00
- Jackson C. T. Apatite Beds of Canada. B. '69, 1.50
- Marsh O. C. Papers. A. J. Mineral Localities in New Brunswick, Nova Scotia etc. '63, 10; Lederite from Nova Scotia. il. 1867. .10
- Report on Products etc. of Ontario at Phila. Exhibition '76. Cat. of Minerals etc. 239 pp. 8. '77, 1. 1.00
- Shutt F. T. Canadian Apatite. 8. unib. '87, 1. .50
- Vennor H. G. Notes on Galena Deposits connected with Laurentian Rocks of Ontario. 8. unib. '75, 1. .10
- Colorado. Berthoud E. L. Uranium, Silver, Iron etc. in Tertiary Formation of. P. Ac. '75. .15
- Comstock T. B. Notes on Geology and Mineralogy of San Juan Co. 23 pp. map, il. 8. stitched, '82, 1. .25
- Endlich F. M. Papers. H. Mining Distr. of Col. with Cat. of Minerals & Min. Notes. 90 pp. 3 maps. 28 pl. il. '75, 15; Geol. of Region of Rio Grande and Huerfano Park, with Cat. of Minerals of Col. 152 pp. 23 pl. '77, 20; Cat. of Minerals found in Col. 25 pp. '73, 20; Geol. of Sweet Water Distr. with Cat. of Minerals. 158 pp. 6 pl. '79, 20
- Fossett F. Colorado: its Gold & Silver Mines etc. 600 pp. 2 pl. 5 maps. 150 il. '80, new, 35; or 1. .25
- Frazer P. Mines & Minerals of Col. 28 pp. H. '73, 15
- Goldsmith. Staffelite, Pike's Peak. P. Ac. '78, 15
- Kunz G. F. Rhodocrosite from Col. 8. st. '87, 1. .10
- Peale A. C. Papers. H. Geol. of Yellowstone Nat. Park etc. with Cat. of Rocks & Minerals. 89 pp. pl. 18
- il. '73, 10; Geol. of So. Park Distr. with Cat. of Rocks & Minerals. 61 pp. 20 pl. '74, 15; Geol. and Mineralogy of Eagle River Valley. 108 pp. 2 maps, 14 pl. '76, 25; Geol. of Green River Div. with Catalogue of Rocks & Minerals. 138 pp. 6 maps, 26 pl. '79, 25; Minerals of Yellowstone Park. 1883. .25
- Smith. Cat. of Minerals of Col. 31 pp. 8. unib. '81, 1. .25
- Connecticut. Brush & Dana. New Mineral Locality, Fairfield Co. New Species. S. p. or unib. '79, 1. .15
- Chrysoberyl of Haddam. A. J. 1822. .15
- Delafield. Am. Andalusite, Litchfield. A. J. '23, 10
- Dwight T. Statistical Account of New Haven. 78 pp. 8. unib. 1811 (Reprint 1874), contains Mineralogy, Lists of Plants, Trees etc. .50
- Eaton A. Minerals found in the great Adit of the Southampton Lead Mine. A. J. 1818. .10
- Gold. T. S. New Locality of Crichtonite. A. J. '39, 10
- Hayes. Cobalt etc. of Chatham Mine. A. J. '32, 10
- Hitchcock E. Geol., Mineralogy etc. of Regions contiguous to Conn. River. 152 pp. col. map, il. A. J. '23, 50
- Lee C. A. Geol. & Min. of Salisbury. A. J. '24. .15
- Shepard C. U. Report on Geol. Surv. of Conn. (entirely devoted to Minerals.) 188 pp. il. 8. p. '37, 1. 2.00
- Extracts and Remarks on the above by B. Silliman. 25 pp. A. J. 1838. .10
- Shepard C. U. Phosphate of Manganese in Conn. New Locality of Tabular Spar etc. A. J. 1827. .20
- Silliman B. Chrysoberyl of Haddam. A. J. '22. .15
- Taylor S. Miscellaneous Localities. A. J. '24. .10
- Torrey J. Columbite of Haddam. N. Y. Lyc. '24. .20
- Tungsten and Tellurium in Conn. A. J. '19. .15
- 72710 Dakota. Mineral Wealth, Climate etc. of the Black Hills. 71 pp. map, il. 8. p. 1876, 1. .35
- Fla. Julien. Minerals of Sombro Key. il. A. J. '65, 10
- Pierce. Geol., Mineralogy etc. of Fla. 18 pp. A. J. '25, 25
- Georgia. Balch. Tellurismuth, Dahlonega. A. J. '63, 10
- Jackson C. T. Bornite from Dahlonega. A. J. '69, 15
- Keeny J. C. Novaculite in Ga. A. J. 1829. .20
- Little G. 2d Report of Progress on Mineralogical, Geol. & Phys. Survey. 16 pp. 8. stitched, 1876, 1. .75
- Peck. Geol. & Mineralogy of Min. Distr. map, A. J. '33, 30
- Shepard. Lazulite, Pyrophyllite etc. In. A. J. .15
- Illinois. Fluor Spar of. A. J. 1821. .10
- 72720 Indiana. Collett J. Papers. 8. unib. 1. Geol. of Martin Co. etc. (much on Iron & Coal.) 227 pp. 6 pl. 3 maps, il. '71, 25; Geol. of Warren, Lawrence, Knox & Gibson Cos. 232 pp. pl. '74 (much on Iron, Coal etc.). .35
- Cox E. T. Papers. S. unib. 1. Geol. of Green, Clay & other Cos. (much on Coal and Iron etc.) 164 pp. 6 sec. '69, 25; Porcelain, Tile & Potter's Clays etc. '79. .15
- Cox. Collett, Hobbs et al. Geol. of Perry, Harrison, Crawford, Dubois, Pike, Wabash, Park & other Cos. (much on Coal.) 421 pp. il. 8. unib. '72, 1. .25
- Thompson M. Compendium of Geology and Mineralogy of Indiana. 18 pp. unib. 1. '86, 1. .20
- Iowa. White C. A. Building Materials, Metals, etc. of. 36 pp. 8. unib. 1870, 1. .50
- Maine. Brush G. J. Papers. A. J. Amblygonite from Hebron. '62, 10; Childrenite from Hebron. il. '63, 10
- Clarke F. W. Topaz from Stoneham. 8. unib. '86, 1. .10
- Jackson. Cancrinite etc. from Litchfield. A. J. '4, 10
- Kunz G. F. Phenacite from Me. etc. 8. st. il. '88, 1, 10
- Leidy. Minerals of Mount Mica. P. Ac. '72. .15
- 72730 Webster. Locality of Idocrase etc. A. J. '48. .10
- Maryland. Godon M. Observations to serve for the Mineralogical Map of the State. A. P. Trans. 1891. .50
- Troost G. Chem. Analysis of Retinasphal from Cape Sable, Ann Arundel Co. A. P. Trans. '25. .25
- Mass. Balch. Orthite in Swampscot. A. J. '62. .10
- Brush G. J. Triphyllite at Norwich. 8. p. '65, 1. .15
- Craw W. J. Chem. Examination of Phosphate of Iron, Manganese & Lithia from Norwich. A. J. '61, 1. .10
- Dana J. F. & S. L. Mineralogy and Geology of Boston & its Vicinity. 108 pp. col. map, 8. bds. 1816, 2. 2.50; or orig. ed. 95 pp. col. map, 4to. unib. 1818, 1. 2.00
- Dana J. D. Phys. & Crystallog. Characters of Phosphate of Iron, Manganese etc. of Norwich. il. A. J. '51, 10
- Davis E. Rocks & Minerals of Westfield. A. J. '26, 15
- Dewey C. Papers. A. J. Mineralogy & Geol. of Vicinity of Williams' College. 1819, 20; Mineralogy & Geol. of Western Part of Mass. 66 pp. col. map. '24. .50
- 72740 Emmons. Miscellaneous Localities. A. J. '24, 10
- Foster J. W. New Locality of Iolite. A. J. '38. .10
- Hartwell. Spodumene Locality, Norwich. il. A. J. '50, 10
- Hitchcock E. Final Report on Geol. of Mass. Vol. 2, complete on Mineralogy and Lithology. 531 pp. 228 il. 4to. unib. 1841, 3, slightly stained. 2.00
- Papers. A. J. Geol. & Mineralogy of a Section of Mass. on Conn. River. col. map, 18, 20; Mineral Localities. '25, 20; Notices of Mineral Localities. 16 pp. '28, 20; Yttrio-Cerite in Mass. 1844. .15

- 5 — "Papers, 8. unb. '88, 1. Cat. of Specimens of Rocks and Minerals illustrating Geol. Surv. 26pp. 30; *Economical Geol. of Mass.* 72pp. 30; *Scientific Geol. of Mass. (Rocks, Minerals etc.)* 441pp. 95 il., 1.00
- 6 — Jackson C. T. Papers, Analysis of Pink Scapolite & Cerium Ochre from Bolton. B. C. '44, 25; *Analyses of Minerals from Emery Mine, Chester.* A. J. '66, 15
- 7 — Kimball J. P. Sodalite & Elaeolite, Salem. A. J. '60, 10
- 8 — Lee C. A. Minerals of Pittsfield. A. J. 1825, 10
- 9 — Mallet J. W. Papers, A. J. Phosphate of Iron and Manganese from Norwich. '54, 10; Rose-colored Mica of Goshen. 1857, 10
- 72750 — New Localities of Agate, Chalcedony, Chabasie, Stilbite, Analcime, Titanium etc. A. J. '18, 10
- 1 — Shepard C. U. Papers, New Mineral Localities. A. J. '25, 10; Catalogue of Minerals within 75 miles of Amherst College, stitched, 1876, 1, 10
- 2 — Silliman B. Papers, A. J. Notices of Minerals and Rocks, chiefly in Berkshire. '22, 15; Phosphate of Lime from Williamsburg, & Localities of other Minerals. '25, 10; Gibbsite & Allaphone, Richmond. '49, 15
- 3 — Smith J. L. Emery Mine of Chester Co. A. J. '66, 10
- 4 — Teschemacher J. E. Occurrence of Phosphate of Uranium in Tourmaline Locality, Chesterfield. B. J. '44, 15
- 5 — Wadsworth M. E. Mineralogy and Petrography of Boston and Vicinity. 22pp. B. 1877, 25
- 6 — Webb. Localities of Fluor Spar, Talc etc. A. J. '24, 10
- 7 — Williams. Locality of Rubellite, Beryl etc. A. J. '26, 15
- 8 Mexico. Antisell et al. Geol. and Mineralogy of the Isthmus of Tehuantepec. col. pl. sect. 8. unb. '52, 1, 75
- 9 — Kimball J. P. Grahamsite in the Huasteca and Geology of that Region. A. J. 1876, 20
- 72760 — Raines G. W. Notes on Mines of Mex. A. J. '48, 10
- 1 Michigan. Delafeld J. Localities of Simple Minerals along N. Coast of Lake Superior. N. Y. Lyc. '24, 25
- 2 — Jackson C. T. Papers, Ores & Minerals of L. Superior. '46, 10; Catalogue of Mich. Minerals. Sm. 1855, 10
- 3 — Products of Mich. at Centennial Exhibition. Cat. of Minerals, Copper Ores etc. 72pp. 8. p. '76, 1, 50
- 4 — Whitney J. D. Wollastonite, Jacksonite and Chlorastrolite from Lake Superior. B. J. '45, 25
- 5 — "New Localities, L. Superior Region. A. J. '59, 20
- 6 — Winchell. Saliferous Rocks & Salt Springs. A. J. '62, 10
- 7 Minnesota. Cat. of Mineralogical & Geol. Specimens in State Museum. 34pp. 8. unb. '80, 1, 15
- 8 — Eames H. H. Report on Metalliferous Region bordering on Lake Superior. 55pp. 8. p. 1867, 1, 200
- 9 — Whittlesley C. Report of Explorations in Mineral Regions 1848. '59 & '64. 54pp. 28 il. 8. st. '66, 1, 125
- 72770 — Winchell. Mineralogy of, 29pp. 8. unb. '84, 1, 65
- 1 Missouri. Chauvenel R. Chemical Analyses of Ores, Coals etc. 8. unb. 1874, 1, 35
- 2 — Elliott R. S. Minerals of Mo. 16pp. 8. unb. '68, 1, 15
- 3 — Leonhardt A. V. Papers, 8. unb. 1. Notes on Mineralogy of Mo. '84, 30; Occurrence of Millerite in Mo. Text, 2 photo-lithographic pl. 4 figs. '84, 50
- 4 — Pumpelly R. Report on Iron Ores and Coal Fields of Mo. Vol. Text. 671pp. pl. sect. 190 il. 8. '73, 1, and folio Atlas of 14 sheets, unb. 1, 300; or, Text alone, 100
- 5 — Thompson. Mineral Deposits etc. of 8. unb. '71, 1, 15
- 6 — Wilber. Mineral Wealth of 8. unb. '70, 1, 15
- 7 Nebraska. Hicks L. E. Geyserite in 8. unb. '88, 1, 10
- 8 Nevada. Hoffman. Mineralogy of. 15pp. H. B. '78, 15
- 9 — Silliman & Blake. Gay-Lussite from. il. A. J. '66, 15
- 72780 New Hampshire. Dewey C. Crystallized Steatite from; Zoisite from Vt. etc. A. J. 1822, 10
- 1 — Hitchcock C. H. Reports on Geol. & Mineralogy of N. H. 8. p. 1. 1st. '69. 36pp. col. map. 35; 2d '70. 37pp. col. map. 50; 3d '71. 82pp. 50; 4th '72. 56pp. col. map. 50
- 2 — Hubbard O. P. Mineralogy and Geology of the White Mountains. 20pp. 6 il. A. J. 1838, 15
- 3 — Jackson C. T. Final Report on Geol. & Mineralogy of N. H. 384pp. 3 maps, 8 tinted pl. 45 il. 4to. hcf. 1844, 1, much on Metallurgy of Iron, etc., 600
- 4 New Jersey. Bourne. Zeolite Locality etc. A. J. '41, 15
- 5 — Chamberlin B. B. Minerals of the Weehawken Tunnel. 8. stitched, 1883, 1, 15
- 6 — Cook G. H. Marls of N. J. 95pp. 11 il. 8. unb. '77, 1, 30
- 7 — Finch J. Arragonite near N. Brunswick. A. J. '30, 10
- 8 — Fowler S. Sapphire and other Minerals in Newton Township, Sussex Co. A. J. '32, 15
- 9 — Goldsmith E. Asphaltum and Amber from Vincetown. P. Ac. '79, 15
- 72790 — Nuttall T. Minerals of Patterson and the Valley of Sparta. A. J. 1822, 20
- 1 — Report of Com. on Centennial Exhibition. Cat. of Minerals etc. by Cook. 430pp. map. 6 pl. 8. p. '77, 1, 50
- 2 — Roepper W. T. Minerals from N. J. A. J. 1870, 10
- 3 — Seymour E. List of Minerals of 8. unb. '68, 1, 20
- 4 — Teymour J. Analysis of Datholite from. A. J. '20, 10
- 5 — Tyler & Shepard. Anal. of Spartaite from. A. J. '65, 15
- 6 — Vanuxem L. Papers. P. Ac. J. '21. Geol. & Mineralogy of Franklin. col. pl. 30; New Locality of Autamille in N. J., 35
- 7 — Woodhouse. Titanium in N. J. 8. unb. 1808, 1, 10
- 8 New York. Bailey. Mineralogy of N. Y. Isl. 8. st. '65, 1, 20
- 9 — Beck L. C. Mineralogy of N. Y. 560pp. 8 pl. 53 tables, 533 fig. 533 il. 4to. '42, 1, 200; or, 2, 150; or, 3, 100
- 72800 — "Reports on the Mineralogical & Chem. Department of the N. Y. Survey, 8. unb. 1. 1837. 46pp. 30; '38. 73pp. 25; '39. 48pp. 35; '40. 67pp. 35; '41. 24pp. 25
- 1 — "Papers, 8. unb. 8. 1. Pseudomorphous Minerals of '43, 15; Report on Mineralogy of. 43pp. 20 il. 50, 25
- 2 — "Papers, A. J. Trappean Minerals of N. Y. & N. J. '42, 15; Minerals hitherto found in N. Y. 1843, 20
- 3 — Bergemann. Allanite from West Point. A. J. '52, 10
- 4 — Blake. Lanthanite & Allanite, Essex Co. A. J. '58, 15
- 5 — Bonny J. S. Schoharie Minerals. A. J. 1835, 10
- 6 — Brush & Dana. Crystallized Danburite from Russell, St. Lawrence Co. 7 il. 8. p. or unb. '80, 1, 45
- 7 — Catalogue of Cabinet of Nat. Hist. of N. Y. (Cat. of Minerals & Rocks by Beck.) 285pp. 8. 1853, 1, 75
- 8 — Chamberlin B. B. Minerals of New York Co. including a List complete up to date. 25pp. 8. p. 1888, 1, 25
- 9 — Cuthbush. Min. Localities near West Point. A. J. '24, 10
- 72810 — Craw. Phlogopite, St. Lawrence Co. A. J. '50, 10
- 1 — Craw & Gray. Mineralogy of a Portion of Jefferson and St. Lawrence Counties. A. J. '34, 15
- 2 — Emmons E. Reports on 2d Geol. Distr. 8. unb. 1. 1837. 56pp. (Cat. of Minerals), 30; '38. 64pp. (Desc. of new minerals, Eupyrcroite etc.), 30; '39. 39pp. (Kaolin, Marble etc.), 25; '40. 95pp. (much on iron ores etc.), 25; '41. 24pp., 25
- 3 — Fibrous Sulphat of Barytes at Carlisle. A. J. '20, 10
- 4 — Finch J. Min. & Geol. of St. Lawrence Co. A. J. '31, 10
- 5 — Fowler. Minerals discovered in Warwick. A. J. '25, 10
- 6 — Gebhard J. Geol. & Min. of Schoharie. A. J. '35, 15
- 7 — Hall. Plumbago of Ticonderoga. A. J. 1823, 10
- 8 — Hall J. Reports on 4th Distr. of Geol. Surv. 8. unb. 1. 1838. 87pp. 15; (Economic Geol. of Monroe Co. etc.), 30; '39. 53pp., 25; '40. 84pp. (Economic Geol. of Cataraugus Co., by E. N. Horsford), 35
- 9 — Hough F. B. Papers, A. J. Mineral Localities, '50, 10; Mineral Localities of Lewis, Jefferson & St. Lawrence Cos. '50, 10; New Mineral Localities, '56, 10
- 72820 — Jackson. Eupyrcroite, Crown Point. A. J. '51, 10
- 1 — Jessup A. E. Geol. & Mineralogical Notice of the N. E. Part of N. Y. P. Ac. J. 1821, 20
- 2 — M'Cauley R. Earthy Substance found near Niagara Falls. A. P. Trans. 1793, 20
- 3 — Mather W. W. Reports on 1st Distr. of Geol. Survey (contain much on Minerals), 8. unb. 1. 1837. 35pp., 25; 1838. 63pp. (much on iron ore), 25; '39. 131pp. (Horton's Report on Orange Co.; Gale's Report on N. Y. Co., very full on minerals), 50; '41. 60pp., 25
- 4 — Meade W. New Locality of Zircon in. A. J. '29, 10
- 5 — Nason F. L. Some New York Minerals and their Localities. 19pp. pl. 9 fig. 8. p. 1888, new, 15
- 6 — Observations during a Tour in 1835 to the Falls of the Cayahoga. 84pp. 20 il. 1837, much on Min., 35
- 7 — Pierce J. Papers, A. J. Carbonate of Magnesia and very uncommon Amianthus near N. Y. '18, 10; Native Crystallized Carbonate of Magnesia on Staten Isl. & Mineralogy of the Isl. '18, 10; Mineralogy etc. of Secondary Regions of N. Y. & N. J. '20, 20; Mineralogy etc. of the Catskill Mountains. '23, 20
- 8 — Root E. W. Wilsonite, St. Lawrence Co. A. J. '68, 10
- 9 — Sahlie, Augite etc. New Localities of. il. A. J. '24, 20
- 72830 — Schaeffer F. C. Localities in N. Y. etc. A. J. '19, 15
- 1 — Shepard C. U. Papers, A. J. Mineralogy of Orange Co. N. Y. and Sussex Co. N. J. map. il. '32, 20; Strontianite of Schoharie. '35, 15
- 2 — Steel J. H. New Locality of Chrysoberyl. A. J. '22, 15
- 3 — Vanuxem L. Reports on 3d Distr. of Geol. Survey, 8. unb. 1. 1837. 26pp. 20; '38. 34pp. (economic geology), 20; '39. 45pp. (minerals etc.), 25; '40. 34pp. (economic geology by E. S. Carr), 20
- 4 — Young. Phosphate of Lime, Edenville. A. J. '33, 10
- 5 North Carolina. Booth J. C. Analysis of Ores of Lead, Silver, Copper, Zinc etc. from King's Mine. A. J. '41, 10
- 6 — Dabney. Cassiterite from King's Mt. S. st. '54, 1, 10
- 7 — Genth & Kerr. Minerals and Mineral Localities of N. C. 128pp. 8. p. 1885, new, 50
- 8 — Glenn et al. Rockingham Co. Climate, Mineral Resources etc. 31pp. 8. p. 1884, 1, 15
- 9 — Humphreys J. T. Papers on Minerals in N. C. 8. unb. 1. Oorundum, 10; Tourmaline, 10; Basal Plane Quartz, and Carbon Silicon Group, 10; Discoveries of Minerals in Western N. C. '80, 10
- 72840 — Hunter. Rarer Min. & Localities in. A. J. '33, 10
- 1 — Lewis H. C. Minerals of Surry Co. P. Ac. '80, 10
- 2 — Olmsted. Cat. of Rocks & Minerals of. A. J. '22, 30

Cacoclasite.

PROF. H. C. LEWIS.

"Crystals essentially square prisms, often nearly cubical, with truncated corners. Often an inch in diameter. Tetragonal. Hemihedral. Planes O, ii, 1, 2, 2-i, 2-2, 6-3, the last two probably hemihedral. The angles closely correspond with those of sarcolite, indicating isomorphism with that species.

There is an almost entire absence of cleavage. Lustre, vitreous to resinous.—Hardness, 5-6.—Specific gravity, 3.050-3.057.

Composition, after deducting admixed calcite:

	Si O ₂	O. ratio	
	36.74	.612	6
Al ₂ O ₃	19.79		
Fe ₂ O ₃	1.33	.199	2
Ca O	38.16		
Mg O	.77		
Fe O	.17		
Ca ₂ O	.32	.736	7
P ₂ O ₅	2.49		
H ₂ O	.23		
	100.00		

The quantivalent ratio of bases to silica is 9:6 or 3:2; thus making the mineral a *sub-silicate*.

In Hydrochloric acid, it effervesces for a few moments, on account of the enclosed calcite, but is only slightly dissolved and will not gelatinize, except after fusion.

Before the blowpipe it fuses at 3 with intumescence to a white glass.

Locality: Wakefield, Ontario, Canada, where it is associated with *cubical spinel*, pyroxene, graphite, etc.

Name refers to its poor cleavage."—*Extract from Minutes, Geol. and Min. Section A. N. S., Nov. 26, 1883.*

[The cubical spinel locality, though within ten feet of the other, seems to have no connection with it. I did a large amount of blasting and other work; and could discover no connection between the two deposits. The cubic spinels are even more rare than the Cacoclasite, which is very rare. These were exhibited by me at the September meeting, immediately on my return from collecting them in Canada.—A. E. Foote.]

Mrs. E. H. Richards, the first to analyze our Am. Samarskite, and whose good work in connection with the Society for the Encouragement of Studies at Home is so well known, has issued a little work entitled *First Lessons in Minerals*, intended for use with very young children in the public schools. Although only 32 pages, it is admirably adapted to the purpose for which it is intended. We regret that we have not the author's permission to quote largely from this little work. But as it is the intention to revise it soon, we refrain. We can only say that the course pursued is excellent.

- Smith, Ancient Mica Mines in N.C. Sm. 76, .10
- Wurtz H. Cobalt & Nickel, Gaston Co. A.J. 59, .15
- Ohio, Baldwin, Fluor Spar Locality etc. A.J. 18, .10
- Hildreth S.P. Notices of Minerals etc. A.J. 29, .30
- Orton E. Clays of Ohio etc. 79pp. 8. unb. 784, 1, .80
- Ten Days in O. Minerals, Mines etc. 42pp. A.J. 34, .20
- Penn. Blake, Chester Co. Chlorite, il. A.A.S. 52, .15
- Carpenter G. W. Mineralogy of Chester Co. Pa. 19pp. bound with vol. of other Scientific Matter. bds. 1841, .350
- "Mineral Localities in. A. J. 1825, .10
- " & Spackman. Localities in Del. Co. A. J. 25, .10
- Cist Z. New Locality of Manganese. A. J. 22, .15
- Craw W. J. "Clinoclase" of Chester Co. A.J. 52, .15
- Finch J. Geol. of Country near Easton, with Catalogue of Minerals. col. map, A. J. 1824, .50
- Genth F. A. Mineralogy of Pa., with App. On Hydrocarbons by Sadler. 243pp. map, 8. 1875, 1, .40
- Lea I. Minerals near Philada. 20pp. P. Ac. J. 17, .25
- Lewis H. C. New Localities of Columbite, P. Ac. 82, .10
- Morton, Tabular Spar from Bucks Co. P. Ac. J. 29, .15
- Pierce. Min. Resources etc. of. 21pp. A.J. 27, .35
- Seal, Hydrargillite with Pa. Corundum. A. J. 51, .10
- Seybert. Glossy Actynolite, Del. Co. A. J. 23, .15
- Sharples S. P. Minerals from Chester Co. described by I. Lea. A. J. 1869, .10
- Smith J. L. Papers, A. J. Lesleyite of Chester Co. 69, .10
- Minerals of Wheatley Mine. il. 55, .15
- Young A. Celestine in Blair Co. P. Ac. 75, .10
- Rhode Island, Anthony, Min. Localities in. A.J. 25, .10
- Mason, Misc. Mineral Localities in. A. J. 26, .10
- South Carolina, Laughlin A. C. Mineralogy and Geology of, condensed. 81pp. 2 pl. 8. p. 1887, 1, .25
- Shepard C. U. Nodular Phosphates of. A. J. 69, .10
- 270 Tennessee, Hayden, Fluor Spar in. A.J. 22, .15
- Jackson. Analysis of Allophane from. A. J. 55, .10
- Mallet. Analysis of Idocrase from. A. J. 54, .10
- Safford J. M. Minerals and Rocks of Special Use of Tenn. 7 pp. 8. unb. 1869, 1, .60
- Vermont, Coleman L. Soapstone in. A. J. 35, .10
- Hager A. D. Economical Geology of. 138pp. il. 4to. unb. 1861, 1, .75
- Hall F. Localities of Minerals in. A. J. 24, .10
- Hayes A. A. Mineral Localities in. A.J. 1827, .15
- Hitchcock E. Localities of Minerals in. 4to. unb. 1861, 1, .35
- Jackson C. T. Gold, Silver, Lead and Copper Mine, Bridgewater, Vt. B. 1856, .15
- 280 Virginia, Campbell J. L. Geol. & Mineral Resources of James River Valley. 119pp. col. map, il. 8. 782, 1, .30
- Cornelius E. Mineralogy etc. of Parts of Va., Tenn. and Ala. & Miss. Territories. 28pp. A.J. 1819, .35
- Fisher C. Telluret of Bismuth from. A.J. 1849, .10
- Hotchkiss J. Geographical and Political Summary; Geology, Minerals, Climate, etc. 320pp. 5 col. maps, il. 8. p. 1876, new, .35
- Jackson C. T. Telluric Bismuth of. A.J. 1850, .10
- Kain J. H. Remarks on Mineralogy & Geol. of Northwestern Part of Va. & Eastern Part of Tenn. A.J. 18, .25
- Wisconsin, Gregory J. Industrial Resources of. 329pp. 34, 2, over 50pp. devoted to Mineralogy & Geol., .75
- Irving R. D. Papers, 8. unb. 1. Kaolin in. 28pp. il. 76, .100
- Lapham I. A. Map of Wisconsin, showing Mineral Localities. 48 x 48 inches, col. in cloth cover, 56, 2, 1.50
- "History, Mineralogy etc. of. 255pp. 44, 3, .75
- Wisconsin, History, Resources etc. of, Cat. of Min. Ores etc. by E. T. Sweet. 171pp. 8. p. 1876, 1, .50
- 290 U. S. in General. Bigsby J. J. Geol. & Min. Obs. on N.W. Portion of Lake Huron. 19pp. A.J. 21, .20
- Bringier L. Mineralogy etc. of Regions around the Miss. & its Confluent Waters. 32pp. A. J. 21, .35
- Brush G. J. New Mineral Localities. A. J. 66, .10
- Cross & Hillebrand. Contributions to the Mineralogy of the Rocky Mts. 114pp. pl. 21 fig. 8. p. 85, new, .20
- Dana, Miscellaneous Mineral Localities. A.J. 23, .10
- Dana, Eaton et al. Localities of Minerals in Mass. N. Y. and Conn. il. A. J. 1820, .10
- Hubbard, Minerals & New Localities. A. J. 51, .10
- Meade, Mineral Localities in Mass. & Conn. A.J. 24, .15
- Porter T. D. Notices of Am. Mineralogy, Localities of Minerals (Corundum etc.) etc. 23pp. A.J. 21, .25
- Robinson S. Catalogue of Am. Minerals with their Localities. 323pp. 8. bds. 1825, 1, 1.00; or interleaved, bef. 2, 2.00; or interleaved with Notes and Drawings of Natural History by S. B. Buckley. 2.50
- 2900 —"New Mineral Localities. A.J. 1825, .10
- Shepard C. U. Papers, A. J. Miscellaneous Mineral Localities. 24, 10; Mineralogical Journey in the Northern Parts of New England. 34pp. il. 1830, .25
- Torrey J. Locality of Yenite in U. S. N.Y. Lyc. 24, .15

Coal and Coal Oil.

- 35110 Adams. Coals in Mexico, A. I. M. '82, .15
 1 Antisell T. Photogenic or Hydro Carbon Oils from Coal, etc., 150 pp, il, 8, 1860, 1, 1.50
 2 Ashburner C. A. Anthracite Coal Beds of Pa., 24 pp, large pl. A. I. M. 1882, .30
 3 " Oil Sands of Bradford, Pa., pl. 2 fig, A. P. '80, .25
 4 Atkinson, Gases in Coal Mines, 53 pp, bds, '75, 1, .35
 5 Atlas of Luzerne Co. Pa., 75 col. maps showing locations etc., with explanation, folio, hmo, '73, 1, 2.00
 6 Bald R. Coal Trade in Scotland, and an inquiry into the Condition of Women who carry Coals underground, with an Appendix, 219 pp, 8 hcf, Edinburgh 1812, 1, rare 2.50, or without App. 160 pp, 8, unb, 1808, 3, .75
 7 Bon Harbor, Ky., Coal Mines, Letters by W. R. Johnson, Triplett et al, 39 pp, 8, unb, '49, 1, .50
 8 Bone J. H. A. Petroleum and Wells, Oil Regions of Pa. W. Va., Ky. and O. 153 pp, 1865, 1, .35
 9 Boston & Bridgeport Coal Mining Co. of Cape Breton, Nova Scotia, Text, map, 8, p, '63, 1, .35
 35120 Bowen, E. Coal and Coal Oil, 494 pp, 1865, 1, 1.00
 1 " Pa. Coal Regions, 102 pp, 2 col. maps, Statistical Tables etc, 8, p, '48, 1, copies with maps scarce, .50
 2 Breckenridge, Coal & Oil Co. Ky. Report 1857, with Charter, 15 pp, 8, p, 1, rare, .50
 3 Bull M. N. American Coal, 8 unb, '33, 3, .35
 4 " Defence of Experiments to Determine Comparative Value of Varieties of Fuel, 51 pp, il, 8, p, '28, 3, .35
 5 " Answer to a "Short Reply" to Above, 16 pp, 8, p, '28, 1, .35
 6 Callaway Mining & Manufact. Co. Mo. Charter, Property etc., Analysis of Cannel Coal by Chilton, Booth & Boyce, et al, 20 pp, map, 2 sect, 8, p, '48, 1, .50
 7 Chance H. M. Casualties in Anthracite Coal Mines from 1871 to 1880, A. I. M. 1881, .25
 8 Campbell J. Report on Cumberland Coal Fields, Text, 2 large col. maps, 8 p, '71, 1, many assays, .35
 9 Daddow & Bannan, Coal, Iron & Oil. Our Mines and Min. Resources, 808 pp, 1 map, 224 il, & sect, 8, 66, 1, 5.00
 35130 Dauphin & Susquehanna Coal Co., Penna. Report 1846, '48, each 16 pp, map, 8, pl, each, .25
 1 Dawson J. F. Fossil Plants of Lower Carboniferous, etc., Formations of Can. 47 pp, 10 pl, 146 fig, 8, p, '73, 1, .85
 2 De la Beche, Playfair & Smyth, Report on Gases & Explosions in Collieries, 68 pp, 41, col. maps, il, large 8, unb, 1847, 1, very valuable and rare, 1.50
 3 Derby, G. Anthracite & Health, 76 pp, '68, 1, .35
 4 Derrick & Drill, Discovery, Present Condition, etc., of Petroleum in N. Y., Pa., W. Va. and O., 277 pp, map, 65, 1, .35
 5 Dickson, M. W., Survey of 2,000 Acres of Land (mostly Coal Land) in Cameron Co. Pa., 8, p, '65, 1, .35
 6 Duhamel, Extrait d'un Memoire sur la Houille, 48 pp, large sect, showing reservoirs of oil, 8, unb, 1793, 3, 1.00
 7 Dyer, S., Black Diamonds or Curiosities of Coal, 320 pp, 7 pl, 23 il, 1873, new, 1.00
 8 Eaton, S. J. M., Petroleum, History of Venango Co. Pa., Oil Region, 299 pp, col. map, 5 pl, il, '66, 1, 1.00
 9 Fontaine & White, Upper Carb. Flora of W. Va. and Pa., 132 pp, 38 double pl, 400 fig, 8 hmo, 1880, new, 1.50
 35140 Fossil Fuel, Collieries & Coal Trade of Great Britain, 501 pp, 42 il, 8, unb, London, '35, 1, 1.50
 1 Foster, J. W., Mineral Wealth & R. R. Development, Principally on Ill. Coal, 60 pp, map, 8, p, '72, 1, .30
 2 Franklin Iron & Coal Co., W. Va. 23 pp, map, 8, p, '66, .35
 3 Fulton, J., Coking Coal for Furnace Use, Its Efficiency and Economy, 42 pp, 3 col. pl, 8, unb, '74, 1, .35
 4 Gesner, A., Coal, Petroleum and other Distilled Oils, 181 pp, pl, 47 il, 8, 1865, 1, 1.50
 5 Gillelen, Pa. Oil Regions, 67 pp, 4 pl, 17 maps and charts of Allegheny River, Oil Creek, etc., 8, 1, 1.00
 6 Goodyear, W. A., Coal Mines on the Western Coast of United States, 153 pp, 8, publ. at \$2.50, new, 1.75
 7 Great Kanawha Estate, Va. Evidence, Value & Title, Reports on Coal, Iron, etc., by Hitchcock, Simpson, et al, Surveys by Prof. Locke, 84 pp, 8, p, '58, 1, .50
 8 Hinds, Coal & Its Varieties, 14 pp, 8, unb, '83, new, .15
 9 Hull, E., Coal Fields of Great Britain and elsewhere. Much American, 297 pp, pl, 6 fig, 17 il, map, 1861, 1, 2.00
 35150 Huntingdon and Broad Top Mountain Coal and R. Co. Report 1870, 15 pp, map, 8, p, 1, .35
 1 Jamison, J., Report on Qualities of the Coal Fields and Coal Mines on Western Waters, 8, unb, '53, 3, .35
 2 Johnson, W. R., Report on Am. Coals Applicable to Steam Navigation, etc., 612 pp, 3 pl, 8, unb, '44, 1, + 1.00
 3 " Survey of Lands of the Somerset Iron & Coal Co., 40 pp, 3 l, maps of Coal Field, etc., 8, p, 1860, 2, .75
 4 " Report on Mines, etc., of Clearfield Coke and Iron Co. Pa., 21 pp, large section, 8, p, 1839, 1, .50
 5 Kimball, Sulphur in Coal, 22 pp, A. I. M. '79, .20
 6 Lane & Petit, Illegality and Conspiracy of Anthracite Coal Monopoly, 94 pp, 8, p, 1876, new, .25
 7 Leigh Coal and Navigation Co., History of 68 pp, 2 maps, 8, p, '40, 1, .35
 8 Leigh or Anthracite Coal found in the Great Mauch Chunk Mines. Certificates from many Manufacturers and Others proving its Superiority over every other Kind of Fuel, 18 pp, unb, 1825, 1, rare, .35
 9 Lesquereux, L., Coal Flora of Carboniferous Formations in Pa., and throughout the U. S., 2 vol. bound in 1, 772, pp, 2 pl, 14 fig, new, .60; Atlas to Coal Flora, Text, 85 double pl, over 1,000 figs, 8, hmo, new, 1880, 2.50 or both, 3.00
 35160 Lesley, J. P., Geol. Report for St. Clair R. R. & Coal Co., Mo., Analysis by Lesley, Chilton et al. Letter from B. Silliman, Text, large sect, 8, p, '55, 1, .40
 1 " Iron, Coal and Oil in Various Parts of U. S., 187 pp, 10 large pl, 118 il, 8, 1874, 1, 2.50
 2 " Papers, A. P., Petroleum of Ky. and Borings in Pa., 36 pp, map, pl, 12 il, '65, 50; Lignite in Middle Pa., pp, '64, 30; Coal Mine Wood Co. W. Va., 15 pp, pl, '53, 1, .25
 3 Coal Form. of S. Va., Text, pl, '62, .30
 4 Loiseau, Pressed Fuel from Coal Dust, A. I. M. '80, .25
 5 a. Macfarlane, J., Coal Regions of America, 686 pp, col. Geol. map of Pa. R. R., map of all Coal Regions, 24 other maps, 15 pl, 20 il, 8, new, 4.00
 4 McKean & Elk, Land and Improv. Co. Pa. 1st Report '57, 35 pp, 7 maps of Coal Veins, some col, 8, 1, .30
 5 Map of Pa. Oil District, col. 32x38 inch, in cover 3, 38
 6 Morris, New River Coalfield, W. Va., A. I. M. '79, .25
 7 North of England Inst. of Mining Engineers Trans. Newcastle '58-'59, almost entirely on Coal, Mines and Ventilation by Atkinson, Buddle, Taylor, et al, 244 pp, 23, plans of mines and sect, mostly col, 8, hcf, 1, 2.00
 8 Owen & Needham, Report on Tunungwant Coalfield, McKean Co. Pa., 66 pp, 3 col. sect, 8, p, '57, 1, .75
 9 Pacific Coast Petroleum Co., 15 pp, 8, p, 1865, p. 1, .35
 35170 Peckham, Origin of Bitumens, 17 pp, A. P. '68, .35
 1 Penna. Bituminous Coal Mines, Report of Investigating Commissioners, 50 pp, 8, 1875, 1, .35, or unb, .25
 2 " Coal Co. Reports, 8, p. 1, '52, '53, '54, '55, each, .20
 3 " Inspectors of Coal Mines Reports, 8, 1 or new, 1870, 250 pp, .50; '71, 327 pp, 2 maps, .50; '72, 308 pp, 2 maps, 8, sect, .50; '73, 284 pp, 4 col. pl, map, .25; '74, 226 pp, 2 maps, 2 sect, .35; '75, 228 pp, 4 pl, sect, .30; '76, 183 pp, 6 col. pl, sect, .35; '77, 219 pp, 4 col. pl, 6 maps, sect, .25; '78, 258 pp, 2 maps, 13 pl, & sect, .30; '79, 327 pp, 7 pl, 6 maps, .60; '80, 249 pp, 2 col. maps, 9 pl, & sect, .35; Or the set of 11 vol., 4.00
 4 " Oil Fields and Petroleum, 25 pp, 8, unb, '74, 1, .30
 5 " 2nd. Geol. Surv. Many Coal Rep'ts, see separate pages
 6 Peat Coal & Railway Co. Mass. Reports by Wheeler & Adelberg, 56 pp, 1, map, 8, p, '66, 1, Analyses etc, .30
 7 Rogers, H. C., Coal & Chenango Canal, 24 pp, 8, p, '71, .50
 8 Roy, A., Coal Mines, System of Working, Ventilating, etc., Principal Coal Regions of the World, 367 pp, 2 ports, 4 sect, 7 maps, 17 il, 8, '76, new, pub. at \$2.25, 1.20
 9 St. George Mining and Manufacturing Co., Va. Reports on Coal Lands by J. Hall, 14 pp, map, sect, 8, p, '57, 1, .35
 35180 Seward, F. E., Coal Trade, 104 pp, 10 il, 8, p, '53, 2.00
 1 Sheaffer, P. W., Pa. Anthracite Coal Fields and their Exhaustion, 16 pp, 2 sect, 8, p, 1881, 1, .25
 2 Silliman, B., Petroleum Region Santa Barbara Co. Cal., Report, Estimates, etc., 24 pp, 2 maps, 8, p, 1863, 1, .25
 2 a. Smyth, W. W., Coal and Coal Mining, 263 pp, 48 il, 4th Revised Ed. London, 1875, 1, 1.25
 3 Stutz, S., Coal Washing, 17 pp, 11 pl, A. I. M. '81, .35
 4 Sweet, S. H., N. Y. State Engineer's Special Report on Coal, 94 pp, 8 large maps, 8, '65, 1, 1.75, or p. 1, 1.50
 5 Taylor, R. C., Statistics of Coal & Bituminous Minerals in Am. 641 pp, 5 col. maps, il, 8, 1, 2nd Ed. '55, 1.00
 6 " Statistics of Coal, Geogr. & Geol. Distribution, Production, Consumption, etc., in all Parts of the World, 992 pp, 5 col. maps, il, 8, 1848, 2, valuable, 3.00
 7 " Two Reports on Stony Creek Pa. Coal Estate, 290 pp, 2 maps, 2, 1, sect, 8, hcf, 1840, 1, 1.00
 8 " South Wales Coal Basin, Text, map, 4 to, p, '30, 1, .50
 9 " Notice of a Model of W. Portion of Schuylkill Coalfield, Text, pl, A. J., '41, 1, .35; Or 5, .20
 35190 " & Clemons, Vein of Bituminous Coal near Havana, Cuba, Text, pl, Analysis, A. P. Trans. '89, .50
 1 Wheelley & Stover, Pulverized Fuel Process, Setting Boilers for Burning Waste Coal, 27 pp, 8, p, 1, .35
 2 Williams, C. W., Combustion of Coal and Prevention of Smoke, Report on New Castle Coal, 268 pp, 141 il, 2, 75
 3 " Plates Illustrating Combustion of Coal, 14 large plates, mostly col. 4to, p, 1841, 3, .50
 4 Wrigley, Oil Remaining in Pa. & N. Y., A. I. M. '82, .25
 5 Wright, W., Pa. Oil Regions, 275 pp, 1865, 1, .50

MINERALS AND ALL OBJECTS OF NATURAL HISTORY.

COAL AND COAL-OIL.

Ashburner, C. A. Papers, A. P. Wilcox Spouting Water Well, McKean Co., Pa. '77, 15; Oil Well Records in McKean & Elk Cos. Pa. 18 pp, '78, 10; Constitution of Bradford Oil Sands, pl. 2 figs, '80, 25; Geol. Sect. at St. Mary's, Elk Co., Pa. 11, 1881, 20
Barker, G. F. Analysis of Specimens of Coal from Isthmus of Darien, 4to, unbound, 1874, 1, 30
Barr, W. M. Combustion of Coal, Mechanical Devices, etc. 314 pp, 7 pl. 42 figs. 10 il, 8, '79, new, 1, 75
Bell, R. Petroleum in the N. W. Territories, and new Localities, 8, unbound, 1881, 1, 20
Bradley, F. H. Coal Measures, Geol. etc. of Vermillion Co. Ind. 37 pp, 8, unbound, '09, 1, 25
Briggs, Venango Co. Pa. Oil Region, A. P. '65, 10
Britton & Cresson, Analysis of Rocky Mountain Coal, A. P. 1874, many analyses, 25
Buddie, J. Great Fault called "the Horse" in Forest of Dean Coal Field, 3 il, 4to, unbound, 41, 1, 35
" Subsidiaries from Working Coal Beds, Letter to C. Lyell, 4to, unbound, 1841, 1, 25
Bunker, Vegetable Origin of Anthracite, A. J. '33, 20
" Carpenter, Bituminization of Wood, il, A. J. '39, 20
Carli, J. F. First Systematic Collection, etc. of Venango Co. Pa. Oil Wells, 71 pp, A. P. '77, 20
Chandler, C. F. Report on Petroleum, 110 pp, il, 8, p. 71, 1, 50
Cist, Z. Anthracite Mines about Wilkesbarre, Pa. 16 pp, map, pl. A. J. 1822, 35
Coal and other Products from Line of Reading R. R. Many Analyses of Coal, 44 pp, 8, p. 76, 1, 15
Collett, J. Papers, 8, unbound, 1, Analysis of Coal from Perry, Dubois, & Pike Cos. Ind. '70, 15; Coal Measures, Geol. etc. of Dubois & Pike Cos. Ind. 96 pp, 7 figs, 71, 25; Geol. & Coal Measures of Warren, Law. rence, Knox & Gibson Cos. Ind. 232 pp, 2 pl. il, many analyses, '73, 50
Cox, E. T. Papers 8, unbound, 1, "Black Coal" of Clay Co., Ind. 66 pp, 6 pl. '69, 25; Coal Formation, Geol. etc. of Greene Co. Ind. 23 pp, '69, 25; Coal Measures, Geol. etc. of Perry Co. Ind. 83 pp, '71, 25; Geol. Report of Ind. '75, 115 pp, Analysis of 133 samples of Coal, 25
Dawson & Lesley, Coal Measures of Cape Breton, A. J. 1863, 15
Eaton, A. Papers, A. J. Coal Formations in N. Y. A. J. 31, 50; Pa. Coal Beds equivalent to great Secondary Coal Measures of Europe, '33, 10
Featherstonhaugh, G. W. Anthracite Coal applied to generate Steam Power, 8, unbound, 1831, 1, 20
Fisher & Shearer, Map of 1st & 2nd Anthracite Coal-field, Schuylkill Co. Pa. 2 sect. mounted on cloth, each 40x60 inch, in case, 1, very rare, 5,00
Fyfe, A. Comparative Value of Coals for Illuminating Purposes, etc. 21 pp, A. J. 1849, 30
" Gas Explosion in Black Heath Coal Mine, A. J. '39, 10
Gammer, Richmond, Va., Coal Mines, A. J. '18, 30
Haupt, H. Seaboard Oil Pipe Line from Black Fox Run, Pa., to Patapsco River, A. P. '77, 15
Hendry, W. A. Coal in Joggins & Albert Mine Regions, Nova Scotia, il, A. P. 1864, 15
Hidreth, S. P. Bituminous Coal Deposits of the Ohio Valley, Fossil Organic Remains & Relics of Vegetable Bodies, 154 pp, 1. geol. map, 37 pl. 160 figs. of fossil shells, plants etc. A. J. '36, 1,00
Hodge, Tertiary Coal of the West, H. '70, 10
Hitchcock, E. Papers, A. J. Brown Coal Deposit in Brandon, Vt., etc. 23 il, of fossil fruits, '53, 20; Coal-field of Bristol Co. and R. I. '53, 25
" C. H. Coal Area of U. S. 8, unbound, '73, 1, 20
How, Oil Coal, Pictou, Nova Scotia, A. J. '60, 30
Jackson, C. T. Analysis of Bituminous and Anthracite Coal, B. J. 1835, 35
Johnson, W. R. Papers, P. Ac. J. Mechanical Struct. of Coal, and Origin of its Various Kinds, '41, 15; Analysis of Chili' Coal, '41, 15; or, the two papers, 25; South Wales Co., and Pa., Anthracite, '41, 15
" Papers, P. Ac. Crystalloid Anthracite and Bituminous Coal, '41, 20; Rhode Isl. Anthracite, '41, 20; Spontaneous Combustion of Bituminous Coal, '42, 10; Analysis of Am. and European Anthracite and Bituminous Coal, '42, 10; Volatile and Earthy Ingredients of Va. Natural Coke, '42, 15; Properties & Habitues of different Varieties of Coal, '44, 20; Coal, Coke, and Pyrites from Cambria Co. Pa., '44, 15; Relative Heating Power of Coal, '45, 20
" Report on Bradford, Pa., Coalfield, A. J. '40, 20

2 Jones, H. G. Cumberland Coal Basin, A. P. '80, 10
3 " G. Anthracite for Blacksmiths, A. J. '30, 15
4 Lea, M. C. Southern Pa. Coalfield, A. J. '41, 25
5 Lesley, J. P. Papers, A. P. Coal Regions of Montgomery, Pulaski, & other Cos., of So. Va. map, '62, 25; Sect. of Coal Measures of Cape Breton Coast, 17 pp, '62, 30; Remarkable Coal Mine in Wood Co., W. Va. pl. '63, 50; Lignite in Franklin Co., Pa. 20 pp, col. map, 3 pl. 11 col. sect. '64, 35; Petroleum in the Eastern Coalfield of Ky. 36 pp, map, sect. 11 il, '65, 35; Record of Oil-Well Borings in E. Ky. '65, 15; Discovery of Oil at Brady's Bend, Venango Co., Pa., 16 pp, map, '66, 30; Apparent Violation of the Law of Regular Debituminization of Am. Coal Beds coming East, 14 pp, 1. map, 5 il, '71, 25; Record of 14 Oil-Well at Brady's Bend, '72, 10; Outcrop Belt of E. Ky. Coal Field., 1. map, '73, 25; Oil-Well Records, 35 pp, '76, 30
6 Lyell, C. Papers, A. J. Tuscaloosa, Ala. Coal Field, 46, 30; Origin of Coalfields, and Fossil Remains and a Land shell in Interior of an erect fossil tree in Coal Measures of Nova Scotia '53, 35
7 Maclure, W. Pa. Anthracite Region, A. J. '26, 15
7¹ Marlor J. Coal Mining: Improved Syst. of Working & Ventilating Mines. 173 pp, 11 pl. 1854, 2, 1,25
7² Maxwell, V. L. Mineral Coal, 52 pp, il, 8, p. '58, 1, 50
8 Meade, W. Papers, A. J. Am. & European Anthracites, '27, 30; Bricks of Anthracite & Clay, '30, 15
9 Meek & Bannister, Coal-bearing Formations of Wyoming, 21 pp, H. '72, 10
37980 Merritt, North Staffordshire Coal Dis., A. I. M. '80, 20
1¹ Newberry J. S. Rock Oils of O. 8, unbound, 1, 50
1² Palmer W. J. Experiments with Coal Burning Locomotives on Pa. R. R. & Analysis of Pittsburgh & Broad Top Coals by Booth, 69 pp, 8, p. '60, 1, 30
1 Petroleum Well near Burksville, Ky., A. J. '40, 15
2 Pierce, J. Pa. Anthracite Region, etc., 21 pp, A. J. '27, 60
3 Platt, Sullivan Co., Pa. Coal, A. P. '79, 10
4 Pomeroy, S. W. Coal Region between Cumberland & Pittsburgh, Pa., etc., A. J. '32, 10
5 Quimby, Spontaneous Combustion of Coal, P. Ac. '41, 10
6 Rand, H. B. Protection of Oil Tanks from Lightning Stroke, A. P. '81, 10
7 Raymond, Nat. Coke, Chesterfield Co., Va., A. I. M. '83, 20
8 Ritter, Belmont Anthracite Mines, Pa., A. J. '27, 30
9 Rivero, Mineral Coal Mines in Peru, A. J. '56, 10
37990 Rogers, Geol. Age of Va. Coal Formation, P. Ac. '42, 10
1 " Procarbonate of Iron in Coal Measures, A. J. '56, 20
2 " Sadtler & McCarter, "Petrocene," a Product of Destructive Distillation of Petroleum, A. P. '79, 10
3 Schaeffer, Peat of Dutchess Co., N. Y., A. J. '18, 15
4 Schoolcraft, Coal near Lake of the Woods, A. J. '55, 35
5 Shearer, P. W. Papers, A. P. Boring Records from Anthracite Basin, Scranton, Pa., '69, 15; Coal Borings in Wilkesbarre Basin, '69, 10
6 Silliman, B. Papers, A. J. Pa. Anthracite Coal, 21 pp, '27, 35; Rhode Island Anthracite, 23 pp, '26, 75; Anthracite Region of Lackawanna and Wyoming Valley, Pa., 26 pp, 1. map, 3 sect. '30, 25; Journey from New Haven to Mauch Chunk and other Pa. Anthracite Regions, 21 pp, 3 pl. '31, 35; Fountain of Petroleum, called Oil Spring, Alleghany Co., N. Y., '33, 20; Combustion of Wet Fuel in Furnace of Moses Thompson, 5 il, A. J., '40, 30
7 " Hubbard, Chem. Examination of Bituminous Coal from Chesterfield Co., Va., A. J. '42, 15
8 Stevenson, J. J. Upper Coal Measures West of the Alleghany Mountains, 27 pp, il, 8, unbound, '73, 1, 39
9 " Papers, A. P. Alleged Parallelism of Coal Beds, '74, 20; Coal Field, Canyon-City Col. and Quinnimont Coal Group in Va., 24 pp, '81, 35; Upper Freeport Coal Bed, Preston Co., W. Va., 1881, 10
38000 Storer, F. H. Review of Antinsell's Work on Photogenic Oils, etc., 22 pp, A. J., '60, 30
1 Sweet, E. T. Kerosene Oil, 8, unbound, 1875, 1, 20
2 Taylor, R. C. Notice of a Model of a Portion of Schuylkill Coal Field, Pa., 8, unbound, 1840, 1, 35
3 " Model of Western Portion of Southern Coalfield of Pa., col. pl. 5 sect. A. J., '41, 30
4 " & Clemson, Bituminous Coal in the Vicinity of Havana, Cuba, pl. A. P., Trans. '36, 25
5 Turner, E. Chem. Examination of Fire Damp from Newcastle Mines, A. J., 1839, 25
6 Tyson, Sect. of Cumberland Coal Basin, A. P., '69, 20
7 Whittlesey, C. Alleghany Coal Field, 8, unbound, '54, 1, 25
8 Wooldridge, A. S. Geol. and Statistics of Coal Mines near Richmond, Va., A. J., '42, 30
9 Wooten, J. E. Apparatus for Burning Anthracite Coal Waste, A. P. 1876, 20

COAL AND COAL OIL.

- 73250 Aldrich T.H. Hist. Account of Coal Mining Operations in Ala. since 1853. 19pp. 8. unb. '76, 1. .15
- 1 Alexander. Trinidad Asphaltum Lake. 8. unb. '33, 1. .15
- 2 Allen T. Explosibility of Coal Oils. Sm. '62. .15
- 3 " J.H. Western Kentucky Coals & Cokes. A.L.M. '88, 10
- 4 Andre G. G. Treatise on Coal Mining. 2 vol. 577pp. 84 pl. 666 fig. 4to. 1879, new. 12.50
- 5 Antisell T. Manufacture of Photogenic or Hydro-Carbon Oils from Coal etc. 144pp. 8. 1859, 1. 1.00
- 6 " Geol. Report of Coal Lands on Line of Pittsburgh & Connellsville R.R. etc. 16pp. 2 maps. 8. p. '68, 2. .30
- 7 Ansted. Supply and Waste of Coal. 8. unb. 1863, 1. .15
- 8 Ashburner C.A. Report of Progress in Pa. Anthracite Region. Geology of Panther Creek Basin. 454pp. 8 pl. and Atlas of 13 sheets and sect. 8. 1883, 1. 1.00
- 9 Ashburner C.A. Coal. 134pp. 8. p. 1887, new. .15
- 73260 " Papers, 8. p. or stitched, 1. Bradford Oil Distr. of Penna. pl. 79, 15; New Method of Mapping Anthracite Coal Fields of Pa. 3 pl. '81, 25; Kintses's Fire-damp Indicator. A. P. '83, 10; Brief Desc. of Pa. Anthracite Coal Fields. 32pp. col. map. il. '84, 15; Product & Exhaustion of Oil Regions of Penna. & N.Y. map. il. '85, 10; Geol. of Nat. Gas in Penna. & N.Y. '85, 10; Classification and Composition of Pa. Anthracites. 21pp. '86, 10; Geologic Relations of the Nanticoke Disaster. 16pp. 4 il. '88, 15; Geologic Distribution of Nat. Gas in the U. S. 32pp. map, 2 pl. '86, 25; Coal Production in Utah, 1886. '87, 10; Petroleum and Nat. Gas in N. Y. 54pp. col. map, 2 pl. '87, 30; Development and Statistics of Ala. Coal Fields for '87. 20pp. '88, .15
- 1 Ashton et al. vs. Lehigh Coal & Nav. Co. 8. p. 1864, 1. .15
- 2 Aspinwall J. A. F. Receiving and Storing Locomotive Coal for Gr. Southern & W. R.R. 3 pl. 8. unb. '81, 1. .30
- 3 Atlas Eastern Middle Anthracite Field of Pa. Part 1. 8 col. sheets in cover. 8. 1885, new. .75
- 4 Atlas Northern Anthracite Field of Pa. Part 1. 13 col. sheets in cover, 8. 1885, new, 1.25; Same, Part 2. 10 col. sheets in cover, 8. 1888, new. .75
- 5 Atlas Western Middle Anthracite Field of Pa. Part 1. 11 col. sheets in cover, 8. 1884, new. .75; Same, Part 2. 11 col. sheets in cover, 8. 1887, new. .75
- 6 Ayres A. Compressed Oil Gas and its Applications. 63pp. 2 pl. 10 fig. il. 8. p. 1888, new. .60
- 7 Bache B. F. Comp. Analysis of Cumberland, Formosa and Japan Coal. 4to. unb. 1856, 1. .20
- 8 Baer W. Ueber Braunkohlen. 8. unb. 1852, G. 1. .20
- 9 Bainbridge C. E. Peat Fuel. 24pp. 3 pl. 8. unb. '74, 1. .35
- 73270 Bald R. Papers. 8. unb. 1. Temperature of Coal Mines. '19, 15; Coalfield, Dalkeith, Mid-Lothian. '28, 25; Fires in Collieries. 21pp. 2 pl. 7 fig. '28, .30
- 1 Baltzberg C. v. Kohlenwerke von Montrambert u. Beraudiere. 52pp. pl. 7 il. 8. unb. '879, G. 1. .35
- 2 Barnett. Hard and Soft Coal. 8. unb. '86, 1. .20
- 3 Barr. Combustion of Coal. 315pp. 7 pl. 10 il. 8. '79, 1. 1.00
- 4 Bear Valley Coal Co. Reports by Roberts, Thomas, Johnson, Hall, et al. 73pp. map. 8. p. 1863, 2. .50
- 5 Bischof G. Papers. 8. unb. 1. Chem. Examination of Gases evolved in Coal Mines. 25pp. '40, 50; Employment of Safety Lamp in Coal Mines of Germany. 41. 15
- 6 Blavier. Sp. Gravity of French Coals. 8. unb. 1802, 1. 15
- 7 Blue Creek Oil Co. Report on Lands of. p. '65, 1. .15
- 8 Bone. Petroleum & Petroleum Wells. 153pp. '65, 1. .25
- 9 Bonnard A. H. de Houille (Carbon de Terre, Carbon de Pierre, Carbon Mineral). 69pp. 8. stitched, F. 1. .35
- 73280 Borden W.W. Geol. of Ripley Co. Ind. 24pp. 8. unb. 1876, 1. much on Coal and other Minerals. .10
- 1 Boussingault. Composition of Bitumen. 8. unb. '37, 1. 15
- 2 Boiven E. Coal & Coal Trade. 36pp. sect. 8. st. '62, 1. 35
- 3 Britton & Cresson. Anal. of Rocky Mt. Coal. A. P. '74, 20
- 4 Brown. Pyrites in Bituminous Coal. A. L. M. '88, .10
- 5 Buck. Kanawha Valley Hard Splint Coal. A. L. M. '81, 10
- 6 Buckman. Geology in Coal Seeking. il. 8. unb. '58, 1. 20
- 7 Biddle J. Davy's Safe-lamp. 8. unb. 1817, 1. .10
- 8 Bull M. Experiments to determine Comparative Value of Fuels. 114pp. pl. 8. stitched, 1827, 3. .50
- 9 " Exper. to determine Quantity of Heat evolved in Combustion of Woods & Coals. 63pp. pl. A. P. Trans. '26, 25
- 73290 Bunce J. B. Analyses relative to the Economical Value of Anthracite Coal Ashes. A. A. S. 1851, .10
- 1 Burke J.W. Coal Fields of Ala. 31pp. 8. p. n. d. 1. .20
- 2 Callaway Mining & Manufact. Co. Report by Ridgeway on Cannel Coal Bed etc. 24pp. map, 2 pl. 8. st. '47, 1. 35
- 3 " Same, Annual Reports. 8. p. 1, each. .25
- 4 Calvert F. C. Coal Tar Colours and Improvements in Dyeing etc. 64pp. il. with 28 samples, 1. .75
- 5 " Products from Coal (except Gas). 8. unb. '65, 1. .15
- 6 Cannelton, Perry Co. Ind. at Intersection of Eastern Margin of Ill. Coal Basin. 108pp. map, il. 8. p. '50, 3. 50
- 7 Carl J.F. Report on Oil and Gas Regions, Phillips F. C. On Composition & Fuel Value of Natural Gas. 332pp. 6 pl. 2 maps, 2 charts, 8. 1887, 1. 1.00
- 8 " Oil Well Records & Levels. 412pp. 8. 1877, 1. .35
- 9 " Geol. of Oil Regions of Warren, Venango, Clarion & Butler Cos.; Desc. of Oil Well Rig & Tools etc. 500pp. 23 pl. and Atlas of 22 maps, pl. etc. 8. '80, 1. .25
- 73300 " Geol. of Warren Co. Pa. & Neighboring Oil Regions. 451pp. 2 maps (1 col.), two sheets of sect. 8. '83, 1. 20
- 1 Ceredo Mineral & Railway Co. W. Va. Charter & Report by E. B. Andrews. 24pp. 2 maps (1 col.), 10 il. 8. p. '72, 1. 30
- 2 Chance H. M. Mining Methods and Appliances used in the Pa. Anthracite Fields. 594pp. 54 pl. 60 il. and Atlas of 25 pl. 8. 1883, 1. 2.00
- 3 " Revision of Bituminous Coal Measures of Clearfield Co. Pa. 212pp. 2 col. maps, 58 il. 1884, 1. .50
- 4 " Papers, A. I. M. Available Tonnage of Bituminous Coalfields of Pa. 19pp. '81, 20; Carbonic Acid Gas Process at Kehley Run Colliery Fire. '81, 15; Deep River Coal Field of N. C. '81, 10; Relative Value of Coals to the Consumer. '85, 15; Anticlinical Theory of Nat. Gas. '86, .10
- 5 " Hyner's Station Oil Well Section. A. P. '78, .10
- 6 Chandler C. F. Papers, 8. p. 1. Report on Quality of Kerosene Oil sold in the Metropolitan Dist. 23pp. '70, 20; Petroleum as an Illuminator. 110pp. pl. il. 71, 25
- 7 Clark. Fuel, its Combustion etc. new, last ed., 125
- 8 Clauss C. Steinkohlen und unsere fossilen Brennstoffe. 32pp. 8. unb. 1864, G. 1. .35
- 9 Clifton Co. Pa. Coal Co. Lands of. 8. unb. '54, 1. .15
- 73310 Coal & Collieries, Jan. '54 to June '56. 324pp. 8. unb. 1. .50
- 1 Coal at the Cape of Good Hope. 8. unb. 1801, 1. .20
- 2 Coal Bank Disaster, Blue Rock, O. 32pp. il. p. '56, 1. 20
- 3 Coal Bed; Conformation, Faults etc. 16pp. 8. unb. '65, 1. 20
- 4 Coal-Land Law & Regulations. 8. p. 1882, 1. .20
- 5 Coal Mines of France, Account of. 8. unb. '26, 1. .15
- 6 Coal Monopoly. Coal Trade of Phila. in Reply to Pres. of Philada. & Reading R.R. Co. 16pp. 8. p. 1873, 1. 25
- 7 Coal Oil, Kerosene & Petroleum. 8. unb. 1864, 1. 15
- 8 Coal; Products of U.S. etc. 16pp. 8. unb. '64, 1. .20
- 9 Coal Statistics prepared for the Miners' Jour. 1868 to '73, bound in 1 vol. 358pp. 10 tables, il. 8. hrn. 1.50
- 73320 Coldstream. Explos. of Gas in a Well. 8. unb. '25, 1. 15
- 1 Collet J. Papers. 8. unb. 1. Geol. of Martin Co. Ind. (much on Coal & Iron). 228pp. 6 pl. 3 maps, il. 71, 25; Geol. of Vanderburgh, Owen & Montgomery Cos. Ind. 182pp. 76, much on Coal, 30; Stone Coals in Ind. 34pp. '84, 30
- 2 Collieries, Report on Management of. 8. unb. '55, 1. 20
- 3 Collins. Principles of Coal Mining. 151pp. 139 il. 75, 20
- 4 Colton H. E. Report on Coal Mines of Tennessee and other Minerals. 128pp. map, il. 8. p. 1883, 1. .60
- 5 " Upper Measure Coal-Field, Tenn. 2 pl. A. L. M. '85, 15
- 6 Cone & Johns. Petrolia. History of the Penna. Petroleum Region from '59 to '69. 652pp. 12 pl. 70, 2. 1.00
- 7 Connell A. Production of Naphthaline in an Oil-gas Apparatus. 8. unb. 1832, 1. .15
- 8 Conybeare. Papers, 8. unb. 1. South Welsh Coal Basin. '32, 20; Extension of English Coalfields. '34, .20
- 9 Cope E. D. Report on the Coal Deposits near Zacualtipan, Mex. il. 8. p. 1885, 1. .25
- 73330 Cox. Petroleum Wells in Burma. 8. unb. 1801, 1. 20
- 1 Cox E. T. Papers. 8. unb. 1. Western Coal Measures and Indiana Coal. 17pp. il. A. A. S. '72, 15; Analyses of Indiana Coals. 80pp. '76, .15
- 2 " Collett, Hobbs et al. Geol. of Perry, Harrison, Crawford, Dubois, Pike, Wabash, Parke & other Cos. Ind. (much on Coal). 421pp. il. 8. unb. '72, 1. .10
- 3 Cox E. B. New Method of Sinking Shafts. 19pp. 3 pl. 25 fig. 8. p. 1873, new. .40
- 4 Crew B. Petroleum, its Origin, History, Geology, Technology etc. 508pp. 2 pl. 70 il. 8. 1887, new. 1.00
- 5 Cumberland Coal & Iron Co. Report. '53, 55pp. 8. p. 1. 50
- 6 Dauphin and Susquehanna Coal Co. Reports, each about 16pp. map. 8. p. 1, .15
- 7 Davy Sir H. Wire-gauze Safe-lamps. pl. 8. unb. '17, 1. Original Description of this celebrated invention. .10
- 8 Dawkins W.B. On Coal. stitched, 1870, 1. .10
- 9 Dawson J.W. Coal in Canada. 8. unb. 1858, 1. .30
- 73340 " G. M. Papers, 8. unb. 1. Geol. of Bow Belly River Region, with special reference to Coal Deposits. 24pp. map, 3 pl. '83, 35; Cascade Anthracite Basin. '88, 10
- 1 De la Beche & Playfair. Report on Coals suited to the Steam Navy. 92pp. 5 pl. il. 8. unb. '48, 3. .50
- 2 Dechen H. v. Steinkohlen Reviere in den Dept. der Loire u. der Saone u. Loire. 242p. 2 pl. 8. unb. '43, 1. 1.00
- 3 Derby. Anthracite and Health. 46pp. p. 1868, 1. .15
- 4 Derrick & Drill; Discovery, Development etc. of Petroleum in N. Y., Pa., W. Va., & O. 277pp. map, 65, 2. 25
- 5 Dewey F. P. Papers, A. I. M. Porosity and Specific Gravity of Coke. 15pp. '83, 15; Photographing the Interior of a Coal Mine. 4 pl. '87, .15

(Coal & Coal Oil, 73350.) MINERALS, SCIENTIFIC AND MEDICAL BOOKS, Etc.

- Dickson W. T. W. Desc. of 50,000 Acres of Land, McDowell & Wyoming Cos. W. Va. 18pp. map, pl. il. 8. p. 25
- D'Inville E. V. et al. Pittsburgh Coal Regions and General Mining Methods. 589pp. 26 pl. 13 maps, sheet of sect. il. 8. 1887, 1. 1.25
- Draper H. Petroleum, its History etc. 8. unb. '65, 1. 30
- Drown. Condition of Sulphur in Coal. A. I. M. '81, 1. 10
- 73350 Dry Distilla. of Coal & its Products. 8. unb. '56, 1. 10
- Dunn M. Coal Trade of North England and Coal Mines of Belgium. 257pp. map, 1844, 1. 75
- " Winning and Working of Collieries. 378pp. 28 pl. 8. 48, 3. 1.00; or 2d ed. 402pp. 13 pl. il. 8. 1832, 2. 1.50
- Dussauce H. Coloring Matters derived from Coal Tar, and their Application. 196pp. 1863, 2. 75
- Eaton S. J. M. Petroleum: A History of the Oil Region of Venango Co. Pa. 299pp. col. map, 5 pl. il. '66, 2. 60
- Eight J. Reports on Mines owned by the Sullivan & Erie Coal & R.R. Co. of Pa. col. pl. 8. p. 1869, 2. 35
- Elk Coal & Oil Co. W. Va. Prospectus & Reports by G. J. Phillips, & C. A. deBlessier. 23pp. map, 8. st. '64, 1. 50
- Elliott A. H. Report on Methods and Apparatus for Testing Inflammable Oils. 46pp. 13 il. 8. p. '82, 1. 20
- Emery. Analysis of Iowa Coal etc. 58pp. 8. unb. '70, 1. 20
- Erdmenger u. v. Krug. Verhalten von verschiedenen construirten Sicherheitslampen. 20pp. 8. unb. 42 G. I. 20
- 73360 Erskine D. Self-acting Method of taking Buckets from the Pit Mouth etc. pl. 8. unb. 1845, 1. 20
- Explosions in Coal Mines etc. 24pp. 8. st. '30, 1. 10
- Fairbairn W. Consumption of Fuel and Prevention of Smoke. 21pp. il. 8. unb. 1845, 1. 30
- Fairholme G. Nature of Coal etc. 8. unb. 1833, 1. 15
- Fairley. Ventilation of Coal Mines. 95pp. bds. '82, 1. 25
- Fire Damp. Destruction of etc. 8. unb. 1806, 1. 15
- Fossil Fuel; Hist. & Desc. of Collieries and Coal Trade of Great Britain. 591pp. 42 il. 8. hef. 1835, 3. 50; or 2d ed. 501pp. 42 il. 8. 1841, 1. 1.00
- Fulton J. Notes on Somerset Co. Coal Beds. A. P. '74, 1. 10
- " Fire-gas in Johnstown Mines. pl. il. A. I. M. '85, 15
- Fyle A. Papers. 8. unb. 1. Comparative Value of Oil and Coal Gas. 16pp. '24, 20; Illuminating Power of Coal Gas and Oil Gas. '24, 20; Use of Steam in Economizing of Fuel. '37, 20; Comparative Power of Coal and Coke. '42, 15; Prevention of Smoke and Economy of Fuel. '42, 10; Comparative Value of Parrot Coal. '44, 15
- 73370 Gesner A. Coal, Petroleum and other Distilled Oils. 131pp. pl. 18 il. 8. '61, 2. 50; or 4. 20
- Gillien F. M. L. Oil Regions of Pa. 67pp. 4 pl. 17 maps and charts of Oil Creek, Allegheny River etc. 8. 1. 50
- Gilpin E. Southern Synclinal of Picton Coal Field and How H. Analysis of Two Spring Hill Coals. 13pp. 8. unb. 1876, 1. 35
- Gilpin. Machine for raising Coal etc. pl. 8. unb. '08, 1. 20
- Goodyear. Water Gas as Fuel. 18pp. il. A. I. M. '83, 25
- Great Western Cons. Oil Co. Report etc. 23pp. 8. p. '64, 1. 15
- Green. Explosions of Fire Damp. il. 8. unb. '73, 1. 25
- " How Coal is Formed. 21pp. il. stitched, 1871, 1. 10
- Green Hill Oil Co. Ordinance etc. 22pp. p. '64, 1. 10
- Greenwell C. C. Papers. 8. unb. '57, 1. Searching for Coal. 20; Working Thin Seams of Coal. 15
- 73380 Gresley. Glossary of Coal Min. Terms. new. Led. 1.60
- Harkness & Blyth. Lignites of the Giant's Causeway and the Isle of Mull. pl. 5 fig. 8. unb. 1856, 1. 20
- Harper. Petroleum, its Nature etc. 8. unb. '65, 1. 15
- Harper. Coal Mining Plant. folio, new. last ed., 17.50
- Hatchett G. Change of some of the Proximate Principles of Vegetables into Bitumen. 22pp. 8. unb. '05, 1. 25
- Hauff. Oil-pipe Line to Baltimore. A. P. '77, 10
- Hill F. A. Report on Pa. Anthracite Region. 421pp. pl. 4 col. maps and Atlas of 7 sheets, 8. 1887, 1. 1.00
- Hill. Geol. & Mining in N. Pa. Coalfield. A. I. M., 10
- Hinds J. I. D. On Coal. 14pp. 8. stitched, 1883, 1. 10
- 73390 Hodge J. T. Tertiary Coals of the West. H. 1871, 10
- Hodgson J. Use of Safety-Lamp. 8. unb. '17, 1. 10
- Holdsworth J. Extension of English Coal Fields beneath Secondary Formation. 112pp. 8. 1866, 1. 75
- " Coal Measures in Leicestershire. 8. unb. '33, 1. 10
- Horsford E. N. Explosion of Burning Fluid at Salem, Mass. Feb. 24, 1852. il. 8. p. 1852, 1. 35
- Jovey. Danger from Coal Dust. 8. stitched, '81, 1. 10
- Hull E. Coal Fields of Great Britain. 584pp. 13 maps (col. in pocket), 2 pl. 26 fig. 24 il. 1881, 1. 3.50
- " Papers. 8. unb. 1. Coal Resources of Great Britain. pl. il. '64, 35; History of British Coal Measures. map, 35, 35; The Coal Famine. '73, 20
- Hunt T. S. Notes on Hist. of Petroleum. Sm. '62, 15
- " Coal and Iron in Alabama. A. I. M. 1883, 15
- 73400 " R. Coal as Reservoir of Power. 8. unb. '71, 1. 25
- Hutchinson E. S. Coal Dust in Colliery Explosions. 27pp. A. I. M. 1884, 20
- Illinois Coal Production 1883. 144pp. 8. p. 1, 50
- 3 International Exhibition 1876. Reports and Awards. Group III. contains, Petroleum, by J. L. Smith, etc. 283pp. il. 8. p. 1878, 1. 1.00
- 4 Inundation of a Coalwork at Beaujonc and Remarkable Escape of the Miners. 8. unb. 1829, 1. 25
- 5 Isherwood B. F. Papers, 8. p. 1. Report of Experiments on Pacific Coast Coal. 31pp. '72, 30; Reports on Two Kinds of Coal (New River Bituminous Coal and Splint Coal from W. Va.). 30pp. 1878, 30
- 6 Jackson C. T. Papers, 8. unb. 1. Coal Lands of Egypt, Belmont etc., Deep River, N. C. '54, 20; Report on Coal Fields in Deep River, N. C. '57, 75
- 7 Jeans J. S. Coal Cutting by Machinery. 25pp. 3 pl. 4 fig. 8. unb. 1874, 1. 35
- 8 Jevons. On Coal, its Importance etc. stitched, 1. 10
- 9 Johnson W. R. Report on Am. Coals applicable to Steam Nav. etc. 619pp. 3 pl. 8 hef. '44, 2. 50; or unb. 1. 25
- 73410 " Coal Trade of British Am., & Characters and Values of Am. & Foreign Coals. 179pp. 8. 1850, 2. 1.25
- 1 " Report on Coal Field of Carbon Creek, Bradford Co. Pa. 47pp. 3 maps, 8. stitched, 1840, 1. 35
- 2 " Coal Formation of North Carolina. A. A. S. '51, 10
- 3 " C. F. Reports. 4to. st. 1. Preliminary, on Anthracite Production in U. S. '81, 15; On Bituminous. '82, 15
- 4 Jones. Coal Regions of Formosa. 4to. unb. '56, 1. 20
- 5 Karsten M. Observations and Experiments on Different Kinds of Coal. 43pp. 8. unb. 1827, 1. 35
- 6 Kent W. Apparatus for determining the Heating Power of Different Fuels. 2 il. A. I. M. '86, 15
- 7 Kentucky Geol. Survey. Eight Reports on the Eastern Coal Field. 309pp. 30 pl. of sect. 8. '84, new. 1.50
- 8 " Six Reports on W. Coal Field. 222pp. 8. '84, new. 1.60
- 9 Kentucky Coal Mining Co. Report of J. Pickell on Coal Property etc. 48pp. map, 8. p. 1855, 1. 35
- 73420 Kimball J. P. Papers, A. I. M. Differential Sampling of Bituminous Coal Seams. 32pp. '83, 15; Quenching Coal Field, Somerset Co. Pa. 29pp. 2 pl. 15; Atmospheric Oxidation or Weathering of Coal. 23pp. 15
- 1 Kinahan G. H. Coal Seams of the Leinster and Tipperary Coal Beds. col. pl. 8. unb. 1886, 1. 25
- 2 King J. T. Coal and its Products. 24pp. il. st. '79, 1. 15
- 3 Koenig & Stockder. Lustrous Coal with Native Silver in Porphyry Vein. Col. il. A. I. M. '81, 15
- 4 Lackawaxen Coal Mine & Nav. Co. Address relative to Canal from the Hudson. 24pp. stitched, '24, 1. 75
- 5 Lamprecht A. Papers, 4to. unb. G. I. Ueber das Liasgas. '54, 20; Liasoel u. Paraffin aus den Schiefen von Geisfeld bei Bamberg. 1856, 25
- 6 Le Conte J. Lectures on Coal. 50pp. 30 il. Sm. '58, 15
- 7 Lehigh Coal & Nav. Co. Report 1863. 60pp. 8. p. 1. 30
- 8 Lesley J. P. Manual of Coal and its Topography. 224pp. 66 il. 1856, 1. very rare, 2.50
- 9 " J. P. Geology of the Pittsburgh Coal Region. 39pp. col. map, 8. p. 1886, 1. 15
- 73430 " Papers, 8. unb. 1. Cumberland Coal Fields, Tenn. 5 il. '55, 15; Broad Top Coal Basin, Central Pa. map, il. A. A. S. '57, 20; Records of Oil Borings at Brady's Bend, Pa. 15pp. map, A. P. '66, 25
- 1 Lesquereux L. Principles of Paleozoic Botany. 185pp. 22 pl. 203 fig. 8. unb. '84, 1. 1.00
- 2 Liversidge A. New S. Wales Coals. 32pp. 8. p. '80, 1. 30
- 3 Logan Co. Mining and Manufact. Co. of Va. Reports on Mines etc. by Silliman et al. 21pp. 8. p. '60, 1. 25
- 4 Lykens Valley Coal Co. Report 1844. 28pp. 8. st. 3. 20
- 5 Lyman B. S. Topography of the Punjab Oil Regions. 14pp. map, A. P. Trans. 1873, 25
- 6 " Utility of the Method of the Penna. Geol. Survey in the Anthracite Field. A. I. M. 1883, 15
- 7 McCalley H. Warrior Coal Field of Alabama. 586pp. map, 8. p. 1886, 1. 1.00
- 8 McCreath A. S. Phosphorus in Coal. A. I. M. '79, 10
- 9 McCollough J. On Peat. 37pp. 8. unb. 1820, 1. 20
- 73440 McKean & Elk Land Improv. Co. Pa. 1st Report '57, 35pp. 7 maps of Coal Veins (some col.), 8. 1. 25
- 1 McMillin. Gas Coals of Ohio. 29pp. 8. unb. '84, 1. 35
- 2 Mallett E. J. Fuel Waste and Controlled Combustion. 50pp. 7 pl. 17 fig. 4to. p. 1882, 2. 25
- 3 Maury M. F. Resources of the Coal Field of the Upper Kanawha. 44pp. 8. stitched, 1873, 1. 30
- 4 Mich. Inspector of Illuminating Oils, Reports. 8. p. 1. 20
- 5 Miesse C. Points on Coal and the Coal Business. 481pp. 8. 1887, new, 2.00
- 6 Mineral Charcoal. 8. unb. 1858, 1. 15
- 7 Moffat. Coal from Mine Timber. il. A. I. M. '87, 10
- 8 Mojon. Deposit of Bituminous Wood. 8. unb. 1803, 1. 15
- 9 Moore P. N. Coal Washing. 40pp. 7 pl. 8. p. '84, 1. 30
- 73450 Moses. Coal Field of So. Wales. 156pp. il. 8. '49, 1. 1.25
- 1 Mount Carbon Coal Co. Jackson Co. Ill. Value and Importance of Coal Mines of. 8. p. 1859, 1. 25
- 2 Mount Carbon Coal & Iron Co. Allegheny Co., Md. Prospectus & Report of W. F. Roberts. map, 8. p. '66, 1. 25

- 5 Murray J. New Safety Lamp. 8. unb. 1822, 1. .10
- 4 " D. Petroleum, its Hist. & Properties. 18pp. 8. p. 182, 1. 20
- 5 Mushet D. Papers. 8. unb. 1. Analysis of Pit Coals. 1808, 20; Coals & Cokes from Wood & Pit Coal. 1808, 15
- 6 Newberry J.S. Papers. 8. p. or st. 1. Origin & Relations of Carbon Minerals. 20pp. 82, 20; Origin of Carbonaceous Matter in Bituminous Shales. 82, 15; Physical Conditions under which Coal was formed. 83, 15
- 7 Newton E. I. Microscopic Character of some Peculiar Forms of Coke. pl. 13 fig. 8. unb. 1876, 1. .20
- 8 " H. Manufacture of Coke. 22pp. 8. unb. 84, 1. .30
- 9 N.Y. Fenget Coal Co. By-Laws etc. p. 66, 1. .10
- 73460 N.Y. & Va. Coal & Iron Co. Rep. 22pp. 2 pl. 8. p. 54, 1. 20
- 1 Norwood C. J. Reconnaissance of a Part of the Breckenridge Cannel Coal Dist. Ky. 26pp. 8. p. n. d. 1. .15
- 2 Nova Scotia Coal Mines. 8. unb. 64, 1. .15
- 3 Nystrom J.W. Improvement in burning Hydrocarbons (Patent Specification). pl. folio, 1875, 1. .15
- 4 Ohio State Mining Inspector's Reports. each about 125pp. il. 8. p. 1. .50
- 5 Oil-Dorado of West Va. Great Mineral Resources of West Va., Kanawha Valley etc. 86pp. p. 1865, 1. .35
- 6 Orton E. Preliminary Report upon Petroleum and Inflammable Gas. 200pp. 3 maps. 8. 87, new. 50; or p. .30
- 7 " Horizon of Petrol. & Gas in O. (Abst.) A. A. S. 83, 15
- 8 " et al. Coal Seams and Coal Mines of Ohio. 614pp. 12 maps, and sect. 153 il. 8. unb. 1884, 1. .125
- 9 Our Coal Supply and Our Prosperity. 21pp. col. Coal Map of the World. 8. unb. 1886, 1. .30
- 73470 Our Coal and Our Coal Pits, the People in them, and the Scenes around them. 243pp. il. 1854, 2. .50
- 1 Parrish Coal Co. Report on Land of. 8. p. 64, 1. .15
- 2 Peckham S. F. Product, Technol. etc. of Petroleum. 327pp. 8 maps (1 col.), 3 charts, 31 pl. 4to, st. 84, new. 30
- 3 Origin of Bitumen. 18pp. A. P. 68, .20
- 4 Penna. Pulverized Coal Co. 8. p. n. d. 1. .10
- 5 Penna. Oil Regions. Map of, by Wrigley. 35 x 40 inches, col., folded in cover, 1870, 2. .50
- 6 Penna. Mine Inspectors of Bituminous Coal Fields. Reports, each about 130pp. pl. 8. st. 1. .50
- 7 Perlberg. Steinkohlen Bergbau in Sachsen u. Braunkohlen Bergbau in Boehmen. 71pp. 8. unb. 42, G. 1. .40
- 8 Perutz H. Industrie der Mineraloel, des Petroleum, Paraffins etc. 360pp. 33 il. 8. p. 68, G. new. 3.00
- 9 Petroleum and Kerosene in Foreign Countries. 156pp. 8. stitched, 1884, 1. .35
- 73480 Petroleum and Oil Mines of Pa. 8. unb. 64, 1. .15
- 1 Petroleum, Old and New. 8. unb. 1864, 1. .20
- 2 Philada. Reports of Directors of City Trusts; contain Reports on Coal Lands by H.C. Thomson et al., each about 112pp. pl. sect. 8. 1. .50 to .75
- 3 Phillips. Lower Yorkshire Coal Series. 8. unb. 32, 1. 15
- 4 Phillips G. J. Syst. of Mining Coal. 86pp. 3 pl. 58, 1. 125
- 5 " Geol. Surv. etc. of J. Brotherline's Coal Lands, Blair & Cambria Cos. Pa. map. 8. p. 1858, 2. .50
- 6 Pierpont Oil Co. West Va. Prospectus and Report by W.F. Roberts. map. 8. p. 1854, 1. .25
- 7 Pin-na-kin-nick Min. Co. Va. Reports. 20pp. 8. p. 1. 15
- 8 Piot. Steinkohlenbergbau bei Newcastle on der Tyne. 77pp. pl. 24 fig. 8. unb. 43, G. 1. .50
- 9 Platt F. Clearfield & Jefferson Distr. of Bituminous Coal Fields of W. Pa. 304pp. 10 maps. 139 il. 8. 75, 1. .65
- 73490 " Cambria & Somerset Dist. of Bituminous Coal Fields of W. Pa. 2 vol. 605pp. 10 maps. 195 il. 8. 75 & 77, 1. 85
- 1 " Causes, Kinds and Amount of Waste in Anthracite Mining. 147pp. map, plan of Anthracite Breaker, 20 pl. 35 fig. of mining operations, 8. 1881, 1. .60
- 2 " Report on Indiana Co. Pa. (Coal Fields, Mines in Ligonier Valley etc.) 342pp. col. map, 87 il. 8. 78, 1. .25
- 3 " Some Sullivan Co. Pa. Coals. A. I. 79, .10
- 4 Playfair L. Gases evolved during the Formation of Coal. 20pp. 8. unb. 1846, 1. .30
- 5 Poggi. Petroleum Spring in Italy. 8. unb. 1803, 1. .15
- 6 Ponson. Working & Winning Coal. 16pp. 8. unb. 55, 1. .25
- 7 Poole H.S. Pictou Coal Field. A. I. M. 1885, .10
- 8 Povey-Harper J. Examples of Coal Mining. pls. folio, new, last ed., 14.50; Same, 2d Series. Examples of Coal Mining Plant, folio, new, last ed., 8.00
- 9 Powdered Anthracite and Gas Fuel. Report of Scranton Board of Trade. 75pp. 8. p. 1. .20
- 73500 Prinsep J. Analyses of Several Indian, Chinese & New Holland Coals. 8. unb. 1832, 1. .20
- 1 Pumpelly R. Report on Iron Ores and Coal Fields of Mo. Vol. Text, 671pp. sect., 199 il. 8. 73, 1. and folio Atlas of 14 sheets, unb. 1, 3.00; or, Text alone. 1.00
- 2 Randolph. Notes on Chinese Coals. A. I. M. 86, .10
- 3 Rankin R. J. Economic Value of Semi-bituminous Coal of Cumberland Coal Basin. 48pp. 2 maps. il. 8. unb. 54, 1. 35
- 4 Redwood B. Petroleum, its Product etc. 87, new. .40
- 5 Ribeiro C. Terrenos Anthraciferos e Carboniferos de Portugal. 3 Pts. 96pp. 2 col. maps, 4to. unb. 61, 1. .75
- 6 Report of Committee appointed to investigate the Bituminous Coal Mines of Pa. 50pp. 8. 1875, 1. .75
- 7 Richardson C.S. Kingston Coal Mines. Peoria Co. Ill. 2pp. large map. 8. unb. 1855, 1. .30
- 8 " J. Report on Coal Field of Nanaimo, Comox, Cowichan etc. Brit. Columbia. 43pp. 3 pl. 8. st. 78, 1. 25
- 9 Roberts W. F. Reports on Bituminous Coal and Oil Lands, Kanawha & Fayette Cos. W. Va. 4to. st. 64, 1. 20
- 73510 Rogers W.B. Papers. 8. unb. 1. Temperature of East Va. Coal Mines. 43, 20; Lackawanna Coal Basin. 36pp. il. 54, 35; Conn. Valley New Red Sandstone and Va. & N.C. Coal-bearing Rocks. 65, 15; Nat. Coke in Va. B. 50, 15; Albert Coal Mine. N. B. P. Ac. 50, 15; Coal Fields of the World. 64, .15
- 1 " & Bache. Analysis of Pa. Coals. 20pp. P. Ac. J. 34, 35
- 2 Routledge W. Sydney Coal Field, Cape Breton. N. S. 19pp. A. I. M. 1885, .15
- 3 Sadtler P. S. Papers. A. P. Composition of Nat. Gas from Western Penna. Wells. 76, 10; Composition of Nat. Gas from Western Pa. & N.Y. Wells. 77, .10
- 4 Saline Coal and Manufact. Co. Ill. Reports by D. D. Owen et al. 91pp. 3 large maps. 8. p. 1855, 3. 1.00
- 5 Salisbury J. H. Forest Hill & Elk Ridge Mining Estates. Va. map. 8 pl. of sect. folio, p. 1858, 3. .50
- 6 Saward F.E. The Coal Trade. Production, Prices etc. 1876 to '82. in 1 vol. Immo. 516pp. il. 8. 1. 125
- 7 Schaefer C. Technologie der Fette und Oele der Fossilen. 1120pp. 6 pl. 293 il. 8. p. 1857, G. new. 9.00
- 8 Schmitz. Benzine Safety Lamp. 3 il. A. I. M. 85, .10
- 9 Shapley E. C. Legal Guide for Oil Companies and Stockholders. 34pp. 8. 1865, 1. .50
- 73520 " Coal, Iron, Railroad and Canal Map of Pa. 27 x 50 inches, col. folded in cover, 1864, 1. .50
- 1 Shearer W.P. Papers. 8. p. or unb. 1 Coals & Collieries of Schuylkill Co. Pa. 58, 20; An Acre of Coal Land in the Anthracite Dist. il. 58, 20; Pa. Anthracite Coal Fields and their Exhaustion. il. map, 79, .25
- 2 Sherwood & Platt. Geol. of Potter Co. and Report on Coal Fields. 137pp. col. map. 87 il. 8. 1880, 1. .30
- 3 Sherwood, Platt & Fulton. Bradford & Tioga Cos. Pa. Barclay, Blossburg etc. Coal Fields. Coking of Bituminous Coal. 283pp. 2 col. maps, 3 pl. 25 il. 8. 78, 1. .60
- 4 Siemens C.W. Fuel, and Wormald J. Value of Artificial Fuel as compared with Coal. bds. new. .50
- 5 Silliman B. Papers. 8. p. 1. Report on Rock Oil or Petroleum from Venango Co. Co. 2pp. 55, 15; Report on the Oil Property of the Phila. & Cal. Petroleum Co., Santa Barbara & Los Angeles Cos. Cal. 36pp. 2 col. maps, 65, 50
- 6 " J.M. Kaiping Coal Mine, N. China. 11 il. A. I. M. 87, 15
- 7 Smyth W.W. Coal and Coal Mining. 263pp. 48 il. 4th ed. London 1875, 2. .65
- 8 Stanton F. J. Carbonates of Leadville, Treatise on the Formation of Coal of Col. 84pp. p. 1879, 1. .30
- 9 Steernwiltz. Brown Coal or Lignites. 4to. unb. 88, 1. 10
- 73530 Stevenson J. J. Fayette & Westmoreland Dist. of Bituminous Fields of W. Penna. 2 vol. 783pp. 5 col. maps. 2 pl. 57 il. 8. 1877 and 78, 1. 1.15
- 1 " Greene & Washington Dist. of Bituminous Coal Fields of W. Penna. 430pp. 2 maps, 3 sect. 8. 76, 1. 35; or p. 25
- 2 " Upper Coal Measures West of the Allegheny Mountains. 29pp. il. 8. p. 1873, 1. .20
- 3 Strauch & Cochran. Map of Anthracite Coal Fields of Pa. with Outlets to Market. 15 x 39 inches, col. 79, 1. 25
- 4 Stiehl A.W. Bildung der Steinkohle nach Lindley u. Hutton. 86pp. 8. unb. 1842, G. 1. .25
- 5 Strother D.H. Capital of W. Va. and the Great Kanawha Valley. Resources etc. 31pp. 8. p. 1872, 1. .30
- 6 Stutz S. Improvements in Coal Washing, Elevating & Conveying Machinery. 6 pl. A. I. M. 84, .20
- 7 Sweet E. F. Kerosene Oil. 8. unb. 76, 1. .15
- 8 Tagliabue. Specific Gravity of Coal Oils. 8. unb. 64, 1. 15
- 9 Taylor R. C. Statistics of Coal, Geographical & Geol. Distribution, Production, Consumption etc. in all Parts of the World. 992pp. 5 col. maps, il. 8. 48, 1. 2.00; or 2, 1.50; or 2d ed. by S. S. Haldeman. 641pp. 5 col. maps, il. 8. 1855, 2. .50
- 73540 " Two Reports on Stony Creek, Pa. Coal Estate. 290pp. 2 maps, 2 sections, 8. holoth. 40, 1. 55; or p. 2, 25
- 1 " Two Models and Sections forming Part of Mineral Basin of So. Wales. 4to. col. map, p. 39, 1. .25
- 2 " Coal Fields in China. 8. stitched, 1845, 1. .20
- 3 Thompson M. Natural Gas. 20pp. 8. unb. 86, 1. .20
- 4 Thorpe et al. Coal. Its Hist. etc. il. 8. new, last ed. 3.00
- 5 Tomson H. Sinking of Two Pits at Gneisenau, Dortmund. 8. p. 1887, new. .15
- 6 Tucker W.G. Examination of 25 Samples of Kerosene collected in various Cities 8. unb. 1884, 1. .15
- 7 Union Nat. Oil & Mining Co. W. Va. Reports by Adelberg & Raymond etc. 36pp. 2 maps, il. 8. p. 64, 2. .30
- 8 Upper Economy Petroleum Co. 22pp. p. 1864, 1. .10
- 9 Vogel A. Papers. 8. unb. G. 1. Torfkohlenbereitung in

LITHOLOGY, ETC.

- England, '65, 25; Torfoerkohlung. 24pp. 2 pl. '66, .30
- 73550 Wall J. S. Desc. of Coal Mines of the Monongahela River Region, Pa. 268pp. 5 maps, 19 sect. 12 pl. '84, 1.50
- 1 Walton, Coal Mining. 175pp. 24 pl. 4to. new, last ed., 4.00
- 2 Wardell S. C. Economy of Coal for Colliery Consumption, & Howe G. Coal Washing. 16pp. 7 pl. 8p. '73, 1.00
- 3 Wardle, Reference Book for Colliery Manag. 8, new, 3.50
- 4 Wasmuth, Pittsburgh Coal Bed. il. 8. unb. '88, 1, .10
- 5 Webster, Pitch Lake of Trinidad. 8. unb. '35, 1, .15
- 6 Weeks J. D. Report on Manufacture of Coke. 118pp. 11 pl. 15 il. 4to. stitched, 1884, new, .20
- 7 Western Pa. Oil Co. Report, 1869. 8. p. 1, .20
- 8 West Virginia Oil Region. 8. unb. 1864, 1, .15
- 9 Wetherill, New Var. of Asphalt. A. P. Trans. '53, .15
- 73550 White C. A. Papers, 8. unb. 1. Peat, Petroleum etc. of Iowa. 19pp. pl. '70, .50; Equivalency of the Coal Measures of the U. S. and Europe. A. A. S. '74, .10
- 1 White I. C. Beaver River Dist. of Bituminous Coal Fields of W. Penna. 388pp. 3 maps, 21 pl. 8. '78, 1, .50
- 2 " Geol. of Lawrence Co. Pa. & Correlation of W. Pa. & E. Ohio Coal Measures. 372pp. map, 134 sec. '79, 1, .20
- 3 Whittlessey C. Papers, 8. unb. 1. Empire Mining Co. Salineville, O. il. '74, .15; Coal Seam No. 6, Ohio Geol. B. '74, 20; Phys. Struct. of Ohio Coal Field. A. A. S. '76, 10
- 4 Wilkie F. B. Petrolia, or the Oil Regions of the United States. 82pp. 2 maps, 8. p. 1865, 2, .50
- 5 Williams C. W. Prize Essay on Prevention of the Smoke Nuisance. 48pp. 15 il. 8. p. 1856, 2, .35
- 6 " Combustion of Coal and Prevention of Smoke. 193pp. 8. '41, 1, and 4to. Atlas of 14 pl. (mostly col.), 1.25; or new ed. 268pp. 12 pl. 141 il. '58, 1, .35, or 3, .20
- 7 " W. M. Formation of Coal. 8. unb. 1880, 1, .20
- 8 Willis B. Lignites of the Great Sioux Reservation. Dakota. 15pp. 2 maps (1 col.), 3 sec. il. 8. p. '85, 1, .10
- 9 Wilson, The Wolf Safety Lamp. il. A. I. M. '84, .10
- 73570 Wiltshire T. History of Coal. 8. p. new, last ed., .40
- 1 Wit and Humor of the Oil Fever. Oleaginous Poetry and Prose. 8. unb. 1865, 1, .15
- 2 Wooten J. E. Successful Use of Anthracite Coal Waste in a Locomotive. A. P. '76, .10
- 3 Wrigley, Lucas and Lesley, Special Report on Petroleum of Penna. 130pp. pl. il. 8. 1875, 1, 1.00
- 4 Wright W. Oil Regions of Penna. 275pp. 1865, 2, .25
- Papers from Am. Jour. of Science and Arts.
- 73550 Andrews E. B. Papers. Geol. Relations of Rock Oil. il. 61, .10. Obs. on a Seam of Coal. il. '64, .10. Petroleum etc. in its Geological Relations. il. '66, .15
- 1 Brande Prof. Peat and its Products. 1851, .10
- 2 Castales M. Coal Mines in Cuba. 1842, .10
- 3 Crowthier B. Petroleum Wells in Mex. '68, .15
- 4 Dill J. Immense Coal Bed, Perry Co. O. '51, .10
- 5 Eaton, Argillite, embracing Anthracite Coal. '29, .30
- 6 Gsley S. Origin of Bituminous Coal. 1830, .10
- 7 Hall J. Coal on the Rocky Mts. 1847, .10
- 8 Hayden F. V. Papers. '68. Lignite Deposits of the West. Coal in Nebraska. 10; Rocky Mt. Coal Beds. .10
- 9 Hildreth S. P. Obs. on Coal etc. of Ohio. 1827, .20
- 73550 Hitchcock, Albert. Coal of N. Brunswick. '65, .10
- 1 Hunt T. S. Bituminous & Pyroschists. '63, .10
- 2 Jackson C. T. Papers. Bituminization of Peat and Conversion into Coal. '38, .10; Asphaltic Coal of New Brunswick. '51, .10
- 3 Johnson W. R. Economy of Fuel. 20pp. il. 1833, .15
- 4 " Report on Am. Coals, Rev. of. 27pp. '45, .10
- 5 Le Conte J. Cretaceous Coal in New Mex. '68, .10
- 6 Lesley J. P. Coal Measures of C. Breton. 18pp. il. '63, .10
- 7 Lesquereux, Order in the Ky. & Ill. Coal Measures & their Relations to those in Appalachian Coal fields. '58, .15
- 8 Lewis J. A. Kenawha Gas. 1845, .10
- 9 Macgowan D. J. Coal in China. 1851, .10
- 73590 Maclure W. Obs. on Beudant's Geol. Travels in Hungary, with Remarks on Coal etc. 1824, .10
- 1 Meade W. Analysis of Coal, Tioga River, Pa. '27, .25
- 2 Oil Wells of Penna. & Ohio. 1860, .10
- 3 Peckham S. F. Papers. Cal. Petroleum. '67, .10; Apparatus for Technical Analysis of Petroleum. il. '67, .10
- 4 Piddington H. Analysis of Ball Coal. '52, .10
- 5 Sayles I. Oil Regions of Penna. 1865, .10
- 6 Stillman B. Fuel for Steam Boilers. 1831, .10
- 7 Taylor, Anthracite & Bituminous Coal in China. '46, .10
- 8 Thomas D. Remarks on Eaton's Obs. on the Coal Formations in N. Y. 1831, .10
- 9 Vanuxem, Experiments on Anthracite etc. 1826, .15
- 73510 White C. A. Papers. Coal in Nebraska. '68, .10
- 1 Iowa Coal Measures. '68, .10
- 1 Wiuchell A. Papers. Oil Formation in Mich. etc. '65, .10; Geol. of Petroleum, Canada West. '66, .10
- 2 Wurtz H. Gas Well in N. Y. 1870, .10
- 37650 Agassiz, L. (?), Origin of Mountains, 8, unb. '63, 1.15
- 1 Ansted, D. T. Great Stone Book of Nature. 335 pp. 6 pl. 6 il. 1863, 1, 1.00
- 2 Barnes, Hillocks of San Diego, Cal. 7 il. 8, unb. '79, 1.15
- 3 Blake, W. P. Papers, 8, unb. 1, Grooving and Polishing of Hard Rocks by Sand, '55, .20; Plasticity of Pebbles & Rocks. '69, .20
- 4 Blum, R. Lithurgik oder Mineralien und Felsarten. 501 pp. 3 pl. 13 fig. 37 il. 8, hef. G. '40, 3, .60
- 5 " Lithologie oder Gesteinslehre. 356 pp. 50 il. 8, hef. G. '69, 1 except a few pp. slightly waterstained, 2.00
- 6 Brainerd, J. Origin of Quartz Pebbles of Sandstone Conglomerate, etc. 16 pp. 5 il. 8, p. '54, 1, .35
- 7 Brewer, Age of Cal. Gold-bearing Rocks. A. J. '66, .20
- 8 Brooks, Huronian Rocks South of Lake Superior & Age of Copper-bearing Series. A. J. '75, .20
- 9 Burbank, Boulder Formation. 8, p. '73, 1, .20
- 37600 Dale, T. N. Rhaetic Strata of Val di Ledro in So. Tyrol. 69 pp. col. map, 11 cross sect. il. 8, p. '76, 1, .50
- 1 Dana, J. D. Manual of Mineralogy & Lithology, 482 pp. 387 il. new, last Ed., 1.75
- 2 " Papers, 8, p. or, unb. 1, Staurolite Crystals of Green Mt. Gneisses of Silurian Age, and Slates of Taconic Mts. '73, .20; Characters employed in Distinguishing Different Kinds of Rock. 20 pp. '78, .30; Geol. Relations of Limestone Belts of Westchester Co., N. Y. 19 pp. map, il. '81, .20
- 3 Dewey, Rochester, N. Y. Polished Rocks, 8, unb. '40, 1.25
- 4 Diller, J. S. Felsites and their Associated Rocks, north of Boston. 16 pp. 8, p. 1881, new, .20
- 5 Forbes, D. Struct. of Rock Masses. Foliation and Striation. Text. pl. 9 fig. 8, unb. '71, 1, .35
- 6 Ford, Troy, N. Y. Primordial Rocks. A. J. '71, .15
- 7 Frazer, P. Jr. Papers, A. P. Delesse's "Lithologie du Fond des Mers." '76, 10; Phys. & Chem. Characteristics of Trap from Lancaster Co., Pa. col. pl. '78, .35
- 8 Gibson, J. B. Trap Rocks of Connawago Hills, Dauphin & Cumberland Cos., Pa. A. P. Trans. '20, .35
- 9 Harrington, B. J. Microsc. Struct. of Dyke Cutting Laurentian Rocks. pl. 8 col. figs. il. 8, p. 1, .35
- 37670 Harrison, E. Age of Porphyry Hills of So. Eastern Mo., il. 8, unb. 1868, 1, .15
- 1 Hawes, G. W. Mineralogy & Lithology of N. H. 262 pp. 12 pl. 84 fig. (mostly col.) of microsc. rock sect., etc. il. 4to, hef. 1878, new; but a few copies of this report were printed with separate title p. to accompany the collections of Rocks and Sect. put up by the N. H. Geol. Surv. 7.50
- 2 " Albany Granite, N. H. 4 il. 8, p. 1881, 1, .20
- 3 Holdsworth, J. Battle with the Basalts; Attempt to deliver the Chief or Primary Crystalline Masses from Plutonic Dominion, 55 pp. unb. '54, 1, .50
- 4 Hyatt, Porphyries of Marblehead. 8, unb. '76, 1, .20
- 5 Hunt, T. Sterry. Laurentian Limestones of North America. 54 pp. 8, p. 1871, 1, .50
- 6 " Hist. of some Pre-Cambrian Rocks in America and Europe. 16 pp. A. J. 1880, .15
- 7 James, E. Sandstone & Floetz Trap Formation of W. Part of Miss. Valley. 25 pp. A. P. Trans. '21, .50
- 8 Marcou, J. Taconic Rocks of Vt. and Canada, Letter to J. Barrande. 17 pp. 1 pl. of sect. 8, p. '62, 1, .30
- 9 " Taconic and Lower Silurian Rocks of Vermont & Canada. 15 pp. 8, p. 1862, 1, .25
- 37680 " Classification des Chaines de Montagnes d'une Partie de l'Amerique du Nord. 4to, p. F. '55, 1, .35
- 1 Matthew & Bailey, Age & Relation of Metamorphic Rocks of New Brunswick & Me. 17 pp. 8, unb. '69, 1.25
- 2 Pinkerton, J. Petrolology. A Treatise on Rocks. 2 vol. 1339 pp. 3 pl. 34 fig. il. 8, hef. 1811, 3, 2.50
- 3 Rominger, C. Palaeozoic Rocks of Upper Peninsula of Mich. 108 pp. il. 8, p. 1872, 1, .60
- 4 Russell, I. C. Intrusive Nature of Triassic Trap Sheets of N. J. A. J. 1878, .15
- 5 Rutley, F. Study of Rocks. 331 pp. 88 il. '79, 1, .75
- 6 Swallow, G. C. Rocks in E. Kans. 26 pp. 8, unb. 1, .35
- 7 Symonds, W. S. Old Stones, 149 pp. pl. 1855, 1, .35
- 8 " Stones of the Valley. 281 pp. 8 pl. 1857, 2, 1.00
- 9 Tenney, S. Quartzite of Williamstown, Mass. and Struct. of Graylock Range. 8, unb. '73, 1, .15
- 37690 Vose, G. L. Orographic Geol.; or Origin & Structure of Mountains. 135 pp. 8, 1866, new, 1.00
- 1 Wheatley, C. Mesozoic Red Sandstone of the Atlantic Slope. A. J. 1861, .25
- 2 Zirkel, F. Microscopical Petrography, 313 pp. 12 pl. 67 fig. (many col.) 4to, new, (King's Surv.) 7.50

LITHOLOGY.

- 72460 Adams F. D. Microscopic Structure of some Rocks of the Quebec Group. 15pp. 8. unb. 1883, 1, .35
- 1 Alger F. Sandstones of N. J. etc. 8. unb. 1856, 1, .15
- 2 Allport S. Microscopic Struct. and Compos. of British Carboniferous Dolerites. 38pp. 2pl. 29fig. 8. unb. 74, 1, .50
- 3 Anderson. Quartz Distr. of Loch Ness. 8. unb. '25, 1, .20
- 4 Backstrom H. Rhombenporphyr aus dem Brumunthal in Norwegen. 16pp. 13 il. 8. p. 1888, G. 1, .20
- 5 Bayley. Spotted Rocks from Minn. il. 8. st. '88, 1, .10
- 6 Benton E. R. Amygdaloidal Melaphyre, and Davis. Banded Amygdules of Brighton Amygdaloid. il. B. '80, .20
- 7 Bergemann C. Chem. Zusammensetzung einiger Vulkanischen Gebirgsarten. 48pp. 8. unb. '47, G. 1, .30
- 8 Bischof G. Elements of Chemical and Physical Geol. 3 vol. 1608pp. 8. gilt top. 1854 to '59, pub. by Cavendish Soc. 1, 12, 50; or vol. 3 alone (principally on Rocks), .50
- 9 Black J. Antediluvian Congelation of the Interstitial Water of the Rocks. il. 8. unb. 1841, 1, .20
- 72470 Blake. Portland Building Stone. 8. unb. '80, 1, .25
- 1 Boase H. S. Structure of Rocks. 18 pp. 8. unb. '35, 1, .15
- 2 Bonney. Gabbro from Pennine Alps. 8. unb. '78, 1, .20
- 3 Boue A. Papers 8. unb. 1. Volcanic Rocks of France and Scotland. '20, .15; Beudant's Opinion of Crystalline Rocks of Red Sandstone Formation. 16pp. '24, .15
- 4 Buch. Forms of Granite and Gneiss. 8. unb. 43, 1, .15
- 5 Burbank. Eozoical Limestones of E. Mass. 6il. B. 71, .30
- 6 Burnham S. M. History and Uses of Limestones and Marbles. 407pp. 24 col. pl. 48 fig. 8. '83, 1, .400
- 7 Caswell J. H. Microscopic Petrography of Black Hills, Dakota. 57pp. 2 col. pl. 8. fig. 4 to unb. '80, 1, 1.00
- 8 Chamberlin T. C. Papers. 8. unb. 1. Proposed System of Lithological Nomenclature. '82, .15; Building Material of Wisconsin. '83, .50
- 9 Chatard T. M. Gneiss Dunyte Contacts of Corundum Hill, N. C. 19pp. 8. unb. 1887, 1, .15
- 72480 Clarke. Researches on Lithia Micas. 8. unb. '87, 1, .15
- 1 Collini M. Considerations sur les Montagnes Volcaniques. 68pp. 2 pl. 4to. p. F. 1781, 1, .50
- 2 Conkling A. R. Papers, W. Lithology of Portions of Southern Colo. and N. New Mexico. 77, .10; Lithology and Mineralogy of Portions of Nevada and Cal. '78, .10
- 3 Coffa. Rocks Classified and Described. 8. '78, new, 4.00
- 4 Cox E. T. Building Stone of Ind. 8. unb. '79, 1, .15
- 5 Credner H. Granitischen Gaenge des Saechsischen Granulitgebirges. 120pp. col. pl. 8. unb. '75, G. 1, .75
- 6 Crosby W. O. Papers, B. Compression in Rocks of Boston Basin. '79, .15; Classification of Textures and Structures of Rocks. '81, .15
- 7 Cross, W. Papers. 8. p. 1. Phonolite from Colorado. '87, .20; Eruptive Rocks, Custer Co., Col. 23pp. '87, .20
- 8 " Bretonische Gesteine. 44pp. pl. 8. p. '80, G. 1, .40
- 9 " & Emmons. Hypersthene-Andesite and Trilicinic Pyroxene in Angitic Rocks. 42pp. 2pl. 10fig. 8. p. '83, 1, .20
- 72490 Cutting. Building Stones, etc. 21pp. 8. p. '80, 1, .25
- 1 Dana J. D. Quartzite, Limestone and Assoc. Rocks of Gt. Barrington, Mass. 28pp. map, il. 8. p. or unb. '72, 1, .20
- 2 D'Argenville M. La Lithologie et la Conchyliologie. 497pp. 33 pl. 534 fig. 4to. cf. F. 1742, 2, .250
- 3 Daubeny. Columnar Struct. of Trap Rocks. 8. unb. '22, 1, .15
- 4 Daubree. M. Studies and Experiments on Metamorphism and Formation of Crystalline Rocks. 77pp. Sm. '62, .30
- 5 " Classification pour la Collection des Roches du Mus. D'Hist. Naturelle du Paris. 57pp. 8. p. '67, F. 1, .25
- 6 D'Aubuisson M. Les Volcans et les Basalts de l'Auvergne. 18pp. 4to. unb. 1819, F. 1, .25
- 7 Davy J. Papers. 8. unb. 1. Cause of Induration of Siliceous Sandstone. '46, .15; Detached Rocks in Barbadoes and Formation of Agaric Mineral. '47, .15
- 8 De la Beche Sir H. T. Formation of Rocks of S. Wales and S. W. England. 296pp. 45 il. 8. unb. '46, 1, 1.50
- 9 Delesse. Papers. 8. unb. G. 1. Mandelstein-Porphyr von Oberstein. '51, .15; Hellrother Syenit von Aegypten. '51, .15; Untersuch. des Glimmer Divorit. '51, .15
- 72500 Diller. Peridotite, Elliott Co., Ky. 31 pp. 8. il. 8. p. '87, 1, .10
- 1 Dunn & Sang. Thermal Expan. of Marble. 8. unb. '31, 1, .15
- 2 Dutton C. E. Petrographic Notes on the Volcanic Rocks of Yellowstone Park. H. 1883, .25
- 3 Egleston T. Papers. 8. p. '80, 1. Disintegration of the Egyptian Obelisk in Central Park. .10; Cause and Prevention of Decay of Building Stone. 58pp, .50
- 4 Ehrenberg Prof. Phytolitharien Tuff als Gebirgsart im Toluca Thale, Mexico. pl. 28 fig. 8. p. 1866, 1, .75
- 5 Emmons E. Limestones and Limes. 32pp. 8. unb. 1847, 1, many Analyses, .25
- 6 Endlich. Eruptive Rocks of Col. 73pp. H. '78, .35
- 7 Enys & Fox. Granite of Penryn. map. 8. unb. 33, 1, .25
- 8 Fallon F. A. Das Waldheimer Serpentinegebirge. 47pp. col. map. 8. unb. 1842, G. 1, .25
- 9 Fellenberg L. v. Analysen zweier Porphyre aus dem Maroggiaunneim Iessin. 8. unb. '75, G. 1, .20
- 72570 Forbes D. Structure of Rock Masses (Foliation and Striation). col. pl. 9 fig. il. 8. unb. 1871, 1, .35
- 1 Fox R. W. Certain Pseudo-Morphous Crystals of Quartz. 8. unb. 1846, 1, .15
- 2 Frazer P. Papers, A. P. Traps of Mesozoic Sandstone, York and Adams Cos. Pa. 4 pl. 12 fig. '75, .30; Characteristics of Trap, Williamson's Point, Pa. col. pl. '78, .15
- 3 " Papers, A. I. M. Notes from the Literature of Geol. of Egypt and Examination of the Syenitic Granite of the N. Y. Obelisk. 27pp. '83, .20; Northern Serpentine Belt in Chester Co., Pa. '83, .10
- 4 Gillmore Q. A. Compressive Strength, etc. of Building Stones in U. S. 37pp. 2 pl. 10 fig. il. 8. p. '75, 1, .50
- 5 Gmelin C. G. Origin, etc. of Basalt. 8. unb. '32, 1, .20
- 6 Gratacap L. P. Opinions upon Claystones and Concretions. 17 il. 8. stitched, 1884, 1, .15
- 7 Guembel. Bildliche Darstellung Krystallinischer Gesteine durch Naturseibstdruck. 8. unb. '67, 1, .30
- 8 Hague & Idings. Development of Crystallization in Igneous Rocks, Washoe, Nev. 44pp. 8. p. 1885, 1, .15
- 9 Hall C. E. Geol. of Philada. Co. and Southern Parts of Montgomery and Bucks, with Analyses of Rocks by F. A. Genth. 165pp. col. map. col. sect. 24 il. 8. '81, 1, 1.00
- 72590 " Collection of Rock Specimens, etc. in Museum of Penna. Geol. Survey. 2 vol. 497pp. 8. '78 and '80, 1, .40
- 1 Hardman & Hull. Metaphoric Rocks of Cos. Sligo and Leitrim, Ireland, and the enclosed Minerals, with Analyses of Serpentine. 14pp. col. pl. 4fig. 8. unb. 1882, 1, .35
- 2 Harrington B. J. Dykes cutting Laurentian Rocks; their Microscopic Struct. col. pl. 8. fig. 8. unb. '77, 1, .20
- 3 Hawes G. W. Building Stones of the U. S. 423pp. 58 pl. mostly col.) of micro. struct. etc. il. 4to. unb. '84, 1, 1.50
- 4 Hawes. Greenstones of N.H. col. pl. 8. p. or unb. '76, 1, .20
- 5 Hawthor E. Contribution to Archaean Geol. of Mo. Geography, Petrography etc. 38pp. pl. 6fig. il. 8. unb. '88, 1, .25
- 6 Heilprin A. Town Geology: the Lesson of Philadelphia Rocks. 134pp. 8. pl. 104 fig. il. '40, '85, new, .200
- 7 Herrick C. L. Compend of Laboratory Manipulation, with Hussak's Tables for Determination of Rock-forming Minerals. 67pp. pl. 24 fig. il. 8. st. 1885, 1, .35
- 8 " Papers. 8. unb. 1. Geol. and Lithology of Michipicoten Bay, Lake Superior. 24pp. 4 pl. 40 fig. '87, 1, .25; Some Am. Norytes and Gabbros. pl. 9 fig. '88, .20
- 9 Henry J. Testing Building Materials. Sm. '57, .10
- 72520 Herschel J. F. W. Remarkable Serpentine at Junct. of Sienite with Dolomite, Tyrol. 8. unb. '25, 1, .15
- 1 Hibbert. Passage of Basalt into Granite. 8. unb. '26, 1, .10
- 2 Hildreth. Sebastopol and Hard Rocks. 8. unb. '55, 1, .15
- 3 Hitchcock E. Analyses of Marble, Limestones, Rocks, etc. of Vt. 29pp. 4to. unb. 1861, 1, .35
- 4 " C. H. Papers, A. A. S. Talcosc Schist of Vt. '60, .15; Winoski Marble of Colchester, Vt. '68, .10; Classification of Rocks of N. H. B. '73, .15
- 5 " & E. Unstratified Rocks of Vt., with Catalogue of Rocks, etc. 123pp. 30 il. 4to. unb. 1861, 1, .60
- 6 Hoser J. K. E. Gelisch Berg u. Scharka Thal. Phys.-Mineralog. Monographien. 50 pp. 4to. p. '42, G. 2, .35
- 7 Humboldt A. de. Superposition of Rocks in both Hemispheres. 490pp. 8. 1823, 2, .250
- 8 " Rock Formations. 30pp. 8. unb. '24, 1, .30
- 9 Hunt T. S. Papers. 8. unb. 1. Stratified Crystalline or Metamorphic Rocks of Canada. 18pp. '57, .20; Mineralogy of Metamorphic Rocks of Canada. 64pp. '57, .25; Report on Intrusive Rocks of Can., with Analyses, etc. 48pp. '59, .40; Chem. and Mineralogical Relations of Metamorphic Rocks. '63, .25; Norite Rock. '70, .10
- 72520 Hussak. Determination of Rock-forming Minerals. il. 1886, new, .240
- 1 Hyatt A. About Pebbles. 26pp. p. 1879, new, .10
- 2 Irving R. D. Preliminary Investigation of Archaean Formation of the N. W. States. 68pp. col. map, 7 pl. (2 col. 13fig. of thin sect. of Quartzites, etc.) 8. unb. '85, 1, .50
- 3 " & Chamberlain. Junction between Eastern Sandstones and Keweenaw Series. 124pp. 17pl. 26 il. 8. p. 1885, 1, .20
- 4 " & Van Hise. Secondary Enlargements of Min. Fragments in Rocks. 66pp. 6 pl. 17 col. fig. 8. p. '84, 1, .20
- 5 Jameson R. Papers. 8. unb. 1. Geognostical Relations of Granite, Quartz Rock, etc., Greenstone Wacks, etc. 17pp. '19, .20; Geognostic Desc. of Neighborhood of Edinburgh. pl. 19, .20; Rocks formed by Hot Springs etc. '20, .15
- 6 Jeanettez. Determination of Rocks. 1883, new, .20
- 7 Johnson T. H. Transverse Strength and Elasticity of Building Stones. 2 pl. 8. unb. '82, 1, .25
- 8 Joly J. Notes on the Minerals of the Dublin and Wicklow Granite. 25pp. 4 pl. 12 fig. 8. p. '85, 1, .50
- 9 Julien A. A. Papers. 8. p. or unb. 1. Fissure Inclusions in Fibrolitic Gneiss of New Rochelle. 15pp. pl. il. '78, .30; Spodumene and its Alterations from Granite Veins, Hampshire Co., Mass. 37pp. pl. '79, .50; Dunyte Beds of N. C. '82, .15; Sealed Flaps of Crystal. 16pp. '85, .20

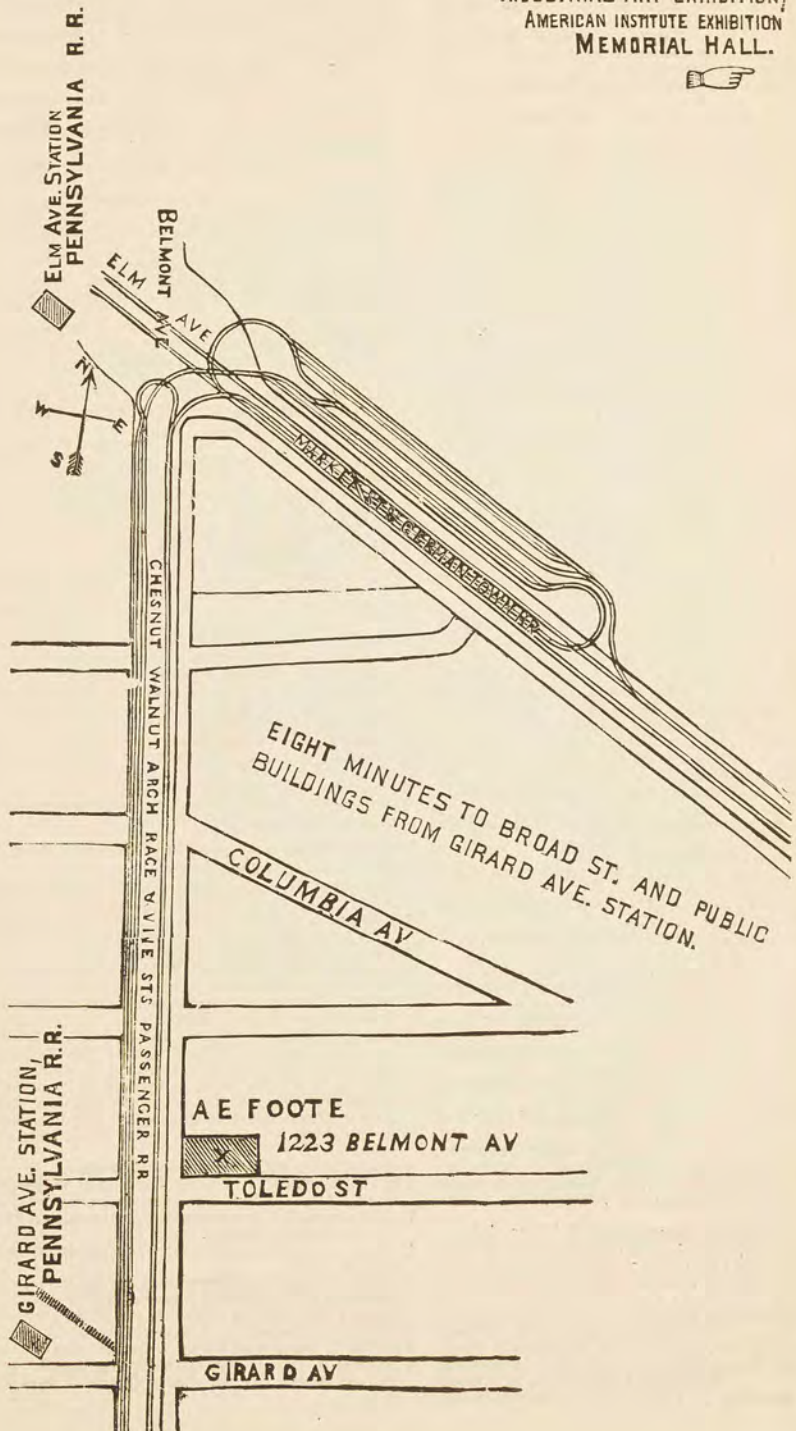
- 72550 " et al. Lithological Description etc. of Rocks of Michigan. 106pp. 29 il. 8. 1873, 1. 2.50
- 1 Kolkowski E. Die Gneissformation des Eulengebirges. 75pp. 3 pl. 30 fig. 8. p. 1878, G. 1. 75
- 2 Keilhan B. M. Formation of Crystalline Limestone, Contact Products etc. 50pp. 8. unb. 1844, 1. 50
- 3 Kinahan G. H. Handy Book of Rock Names with Descriptions of the Rocks. 1873, new last ed., 1.40
- 4 " Papers, 8. unb. 1. Paleozoic Rocks of Galway and elsewhere, said to be Laurentian. 3pl. '82, 35; Marbles and Limestones of Ireland. 83pp. '87. 60
- 5 Knight W. Facts etc. towards a new Theory of the Earth. 35pp. 8. bds. '19, 2, largely lithological, 1.00
- 6 Lawson A. C. Gneiss Foliation and Schistose Cleavage in Dykes. 14pp. 10 il. 8. unb. '86, 1. 25
- 7 Lea. Some Members of Feldspar Family. P. Ac. '66. 15
- 8 Leeds. Lithology of Adirondacks. 35pp. p. '77, 1. 20
- 9 Le Hunte. Analysis of Labradorite Felspar in the Trap Rocks of Scotland. 8. unb. 1832, 1. 20
- 72560 Lepsius R. Bunter Sandstein der Vogesen; Zusammensetzung u. Lagerung. 22pp. pl. 8 unb. '75, G. 1. 25
- 1 Lesley J. P. Chem. Analysis of Siluro-Cambrian Limestone Beds. Cumberland Co., Pa. A. P. '77. 10
- 2 Lieber. Petrology or Study of Rocks. 8. unb. '56, 1. 15
- 3 Liversidge A. Papers, 8. p. 1. Chem. Composition of certain Rocks, N. S. Wales etc. pl. 6 microphotos. '80, 35; Rocks from N. Britain and N. Ireland. '80, 15; Composition of some Wood enclosed in Basalt. il. '80. 20
- 4 Lasaulx A. v. Etudes Petrogr. sur les Roches Volcaniques de l'Auvergne. 224pp. 2 pl. 22 fig. 8. p. '75, 1. 1.00
- 5 Lyell C. Dyke of Serpentine cutting through Sandstone in Forfar. 15pp. pl. 8. unb. 1825, 1. 20
- 6 Mac Culloch J. Papers, 8. unb. 1. Diallage Rock of Scotland. '18, 15; Granite of Aberdeenshire. 23pp. '20, 25; Limestone of Clunie, Perthshire, etc. 16pp. il. 26. 15
- 7 Macknight Br. Lithological Observations in the Vicinity of Loch-Lomond. 8. unb. 1818, 1. 20
- 8 Mathie. Orbicular Granite, Corsica. 8. unb. '13, 1. 15
- 9 Mello. Microscopical Struct. of Rocks. 2pl. 8. unb. '75, 1. 20
- 72570 Merrill N. F. Papers, 8. p. or stitched, 1. Concerning the Lithological Collection of the 40th Parallel. 2 Papers, 47pp. B. '81 and '83, 40; Microscopical Examination and Determination of Me. Building Stones. '82, 15; Black Nodules in the Maine Granites. '83, 10; Collection of Maine Building Stones in U.S. Nat. Mus. 10pp. '83, 20; Prochlorite of D. C. '84, 10; Deposits of Volcanic Dust and Sand in S. W. Nebraska. il. '85, 10; Hornblende Andesites from New Volcano, Bogosloff Isl. Bering Sea. '85, 10; Notes on Min. and Lithology of D. C. '85, 10; Serpentine of Montville, N.J. 2 pl. 7 fig. '83, 35; Building and Ornamental Stones of U. S. P. S. 15
- 1 Miller E. Mushroom Rock, Kans. 3 pl. A. P. '68. 25
- 2 Noeggerath J. Architektonische Mineralogie der Preussischen Rheinprovinz. 37pp. 8. unb. 44, 1. 30
- 3 Oaynhaus & Deeken. Junction of Granite and Killas Rocks, Cornwall. 17pp. pl. 8. unb. '28, 1. 30
- 4 O'Reilly J. P. Occurrence of Microcline Feldspar in the Dalkey Granites. pl. 3 fig. 8. p. 1879, 1. 30
- 5 Orton. Borean Sandstone of O. 8 stitched, '79, 1. 20
- 6 Peale A. C. Minerals, Rocks, Thermal Springs, etc. of Utah etc. 40pp. H. 1872, 15
- 7 Penrose R. A. F. Nature and Origin of Deposits of Phosphate of Lime. 143pp. 36 il. 8. p. 1888, new, 25
- 8 Pfaff P. Einiges ueber Kalksteine und Dolomite. 44pp. 2 pl. 16 fig. 8. unb. 1882, G. 1. 50
- 9 Pictet M. A. On Flexible Stones. 8. unb. 1801, 1. 10
- 72580 Ramond C. Report on Daubuisson's Memoir on the Basaltes of Saxony. 21pp. 8. unb. 1804, 1. 30
- 1 Ramsay A. C. Permian Breccia of Shropshire etc. 21pp. 10 il. 8. unb. 1855, 1. 30
- 2 Rand. T. D. Papers, P. Ac. Rocks near Philadelphia. '77, 20; Lafayette Serpentine Belt. '85, 15
- 3 Ransome & Cooper. Composition of some Limestones for Building Purposes. 18pp. 8. unb. '48, 1. 35
- 4 Raspe R. E. Some German Volcanoes and their Production. 159pp. 2 pl. cf. 1776, 2, rare, 50
- 5 Rath G. vom. Papers, 8. unb. G. 1. Zusammensetzung von Magnesia Glimmer u. Hornblende. 17pp. '62, 25; Kalknatron Feldspathe. '71, 15; Wollastonit-Auswurf. il. '71, 25; Beitrage zur Petrographie. 122pp. 2 pl. 7 fig. 10 il. '75, 1.00
- 6 Richardson. Belleville Stone Quarry, N. J. 8. unb. '58, 1. 20
- 7 Rosenbusch H. Microscopic Physiography of Rock making Minerals. 346pp. 26pl. 156fig. 1211 il. 8. '88, new, 4.00
- 8 Ruskin J. Banded and Brecciated Concretions. 26pp. 5 col. pl. 15 fig. 15 il. 8. unb. 1867 and '68, 1. 1.00
- 9 Rutley. Rock-forming Minerals. 256pp. 1211, 8. p. '88, 1.20
- 72590 " Papers, 8. p. 1. Community of Struct. of Rocks of Dissimilar Origin. 15pp. '79, 20; Microscopic Struct. of Devitrified Rocks from Beddgelert & Snowdon, etc. pl. 5 fig. '81, 25; Microscopic Characters of Vitreous Rocks of Montana. pl. 8 fig. il. '81, 20; Strain in Connection with Crystallization and Development of Perlitic Struct. pl. 8 fig. '84, 20; Eruptive Rocks from St. Minver, Cornwall. pl. 3 col. fig. 3 il. '86, 25; Alteration by Heat in Vitreous Rocks. 3 pl. 24 fig. '86, 30; Perlitic Felsites and Origin of Epidotes. pl. '88. 20
- 1 Sandberger F. Papers, 8. unb. '72, G. 1. Buchonit, eine Felsart aus der Gruppe der Nephelingesteine. 15; Einschlusse in Vulcanischen Gesteinen. 15
- 2 Scott R. H. Granitic Rocks of S. W. of Donegal and associated Minerals. 22pp. pl. 8. unb. '62, 1. 30
- 3 " Griffith & Houghton. Constitution of Donegal Granites and Associated Rocks. 23pp. 8. unb. '63, 1. 30
- 4 Schmidt F. W. E. Basaltgaenge im Rheinisch-westphaelischen Schiefer. 104pp. 4 col. pl. 8. unb. '48, 1. 60
- 5 Sellers C. Machine for Grinding Sections of Hard Substances for Microscopic Purposes. il. P. Ac. '69, 15
- 6 Sheerer F. Bildungsgesetz des Gneuses. 58pp. 8. unb. 1842, G. 1. 35
- 7 Sorby H. C. Papers, 8. unb. 1. Critical Point in Consolidation of Granitic Rocks. '76, 15; Determination of Minerals in thin Sec. of Rocks by Refraction. '78, 20
- 8 Studer. Porphyre des Lugansee's. 8. unb. '75, G. 1, 20
- 9 Thompson. Indiana Building Stones. 8. unb. '86, 1. 10
- 72600 Traill. Granite for Orn. Purposes. 8. unb. '43, 1. 15
- 72610 Tredgold. Flexibility and Strength of Stones. 8. unb. '20, 1. 15
- 1 Van Hise C. R. Papers, 8. p. or unb. 1. Enlargements of Hornblende Fragments. 5il. '85, 15; Origin of Mica-Schists, etc. of Penokee-Gogebic Iron-bearing Series. pl. '86, 15
- 2 Victoria, Australia. Catalogue of Building Stones, Minerals, etc. of. 255pp. 8. p. 1876, 1. 25
- 3 Vose G. L. Distortion of Pebbles in Conglomerates, with Ills. from Rangely Lake. 3 pl. 4to. unb. '69, 1. 75
- 4 Wadsworth M. E. Papers, B. Trachyte of Marblehead Neck, Mass. '81, 15; Argillite and Conglomerate of Boston Basin. '82, 15; Rocks of the 40th Parallel. 20pp. '83, 20; Lithology of Island of Jura, Scotland. '83, 15
- 5 Ward C. Granitic and Associated Metamorphic Rocks of the Lake Dist. 35pp. 2pl. 83 fig. 8. unb. '75, 1. 50
- 6 Williams. Manual of Lithology. 143pp. '86, new, 1.00
- 7 " Modern Petrography. new, last ed., 25
- 8 " G. H. Gabbros and Assoc. Hornblende Rocks, near Baltimore. 78pp. col. map, 3 col. pl. 6 fig. 8. p. '86, 1. 20
- 9 " Papers, 8. p. or unb. 1. Norites of " Cortlandt Series" on the Hudson, N.Y. 20pp. 3 il. '87, 20; Serpentine (Peridotite) in Onondaga Salt Gorge, Syracuse, N. Y. il. '87, 15; Gabbros and Diorites of " Cortlandt Series." il. '88, 15
- 72620 Williamson. Paving Stones. 17pp. st. 1871, 1. 10
- 1 Winchell N. H. Papers, 8. p. or unb. 1. Preliminary Report on Building Stones, etc. of Minn. 37pp. '80, 50; Preliminary List of Rocks of Minn. 105pp. '81, 50
- 2 Wright E. Microscopic Lithology. 8. unb. '76, 1. 50
- 3 Howitt A. W. Certain Metamorphic and Plutonic Rocks at Omeo. 32pp. 2 pl. 6 fig. 8. unb. '88, 1. 50
- 4 Klipstein. Nephelinfels von Melches. 8. unb. '40, 1. 20
- 5 Noeggerath. Granit im Basalte eingeschlossen am Mendelberge am Rhein. 8. unb. '40, G. 1. 20

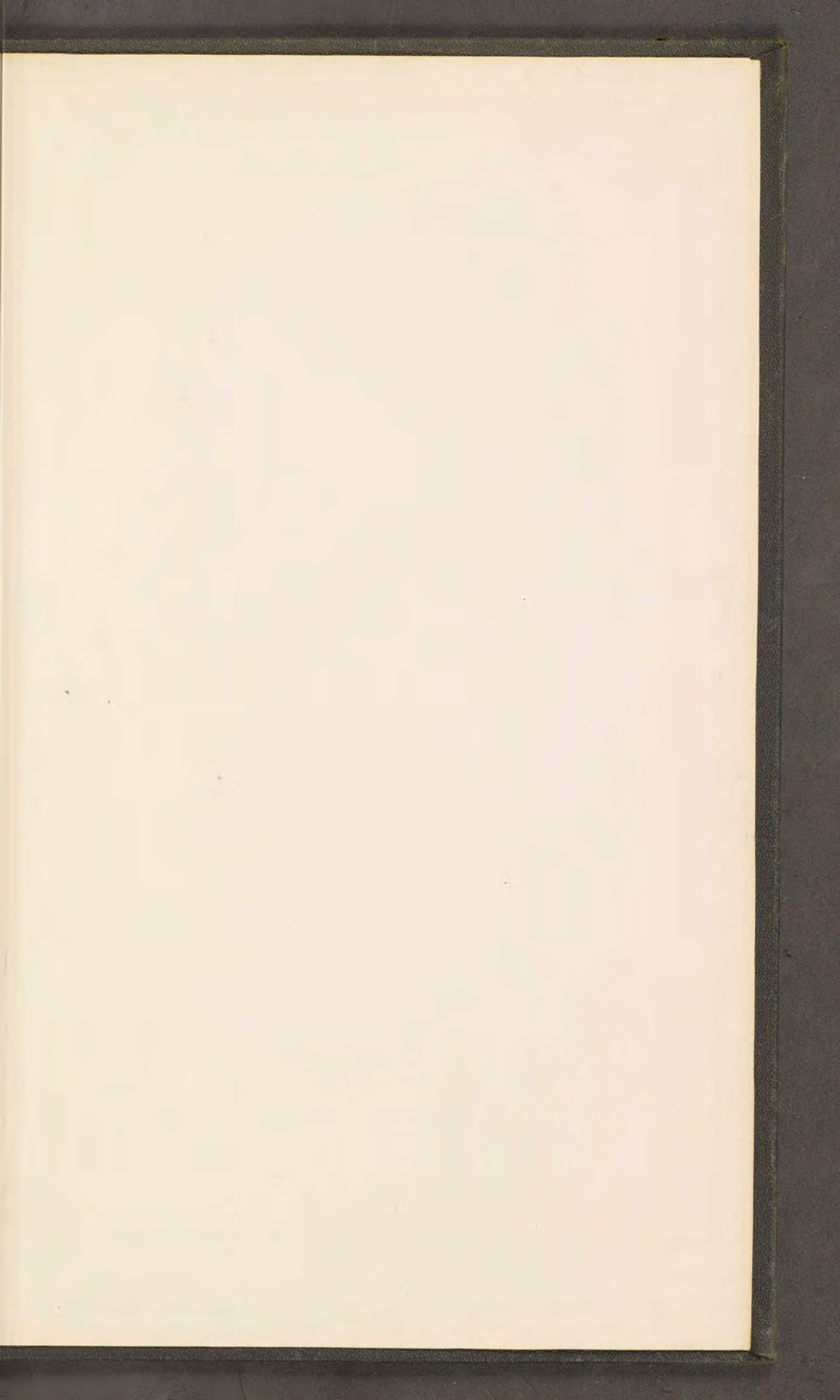
Papers from Am. Jour. of Science and Arts,

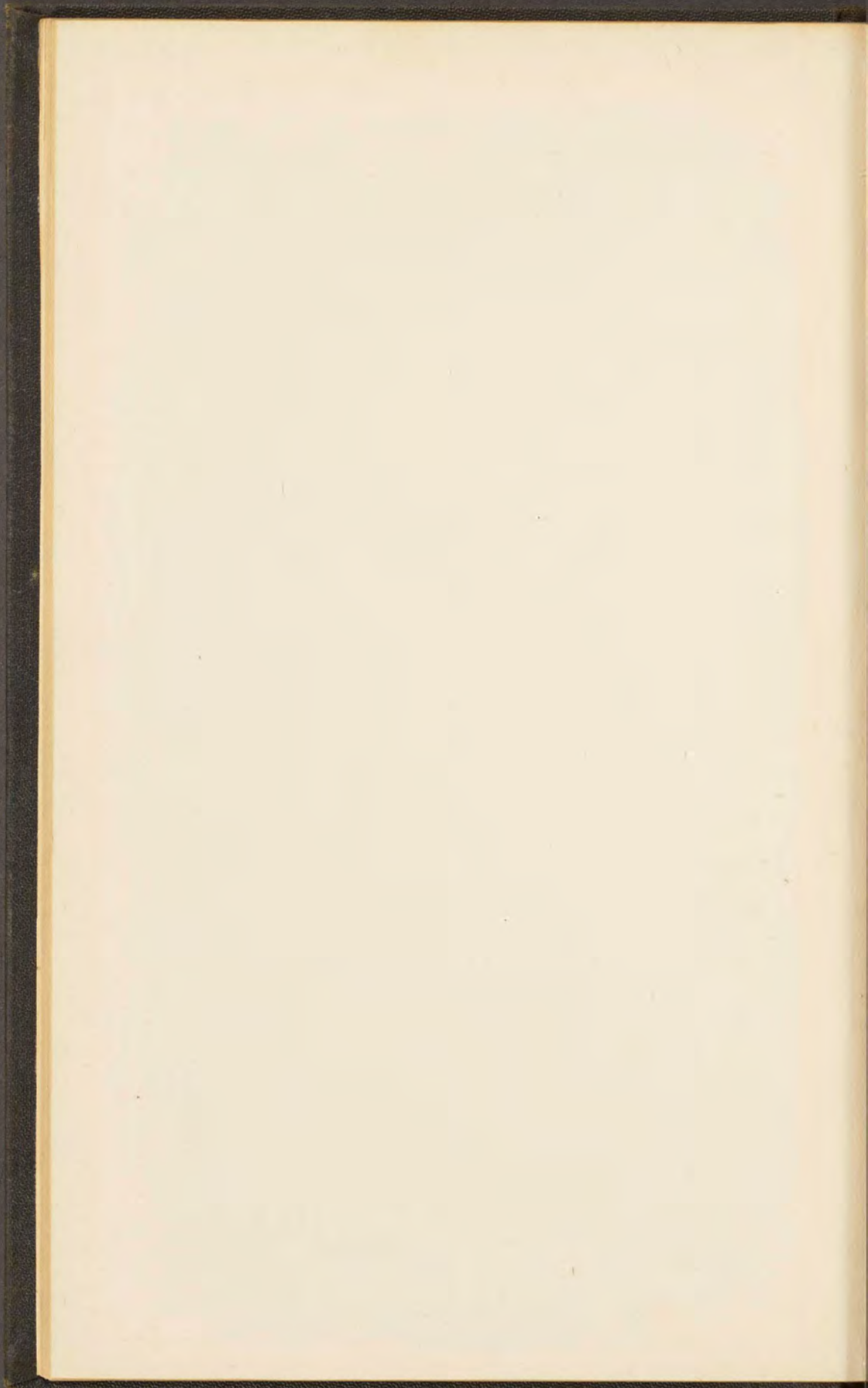
- 72630 Atlee. Certain Cavities in Quartz. il. '39, 10
- 1 Bartlett W. H. C. Expansion and Contraction of Building Stone by Variations of Temperature. il. '32, 25
- 2 Delesse M. Papers. Action of Alkalies on Rocks. '54, 10; Researches on Globiferous Rocks, il. '54, 10
- 3 Dewey. Flexible and Elastic Marble. 1825, 10
- 4 Emmons. Granitic Veins, Chester, N. Y. il. '24, 25
- 5 Hays. Serpentine Rock, Roxbury, Vt. 1856, 10
- 6 Henry J. Testing Building Materials and on Marble used in Extension of U. S. Capitol. '56, 15
- 7 Hitchcock E. Papers. Trap Tuff of Conn. Valley. il. '47, 10; Conversion of Conglomerates into Talcoses and Micaceous Schists and Gneiss. 21pp. il. 1861, 10
- 8 Hunt T. S. Papers. Hist. of Ophiolites. 16pp. '58, 25; Origin of Feldspars, etc. '58, 10; Chem. and Min. Relations of Metamorphic Rocks. '63, 10; Contributions to Lithology. 45pp. '64, 30; Notes on Granite Rocks. 20pp. '71, 35
- 9 Ingelstrom. Bituminous Gneiss, Sweden, '68, 10
- 72640 Jackson C. T. Papers. Analysis of Vt. Serpentine Marble. 40, 10; Analysis of Serpentine Marbles. '57, 10
- 1 Johnson W. R. Comparison of Experiments on Am. and Foreign Building Stones. 17pp. 1851, 10
- 2 Knox G. Bitumen and other Volatile Ingredients in Stones. 1827, 20
- 3 Locke. Alabaster in Mammoth Cave, Ky. il. '42, 10
- 4 MacLaren C. Conducting Power of Rocks. '58, 15
- 5 Mallet J. W. Analysis of Marble etc. of Vt. 1857, 15
- 6 Marble and Serpentine in Vermont. 1839, 10
- 7 Nuttall T. Serpentine Rocks, Hoboken. 1822, 75
- 8 Silliman B. Papers. Am. Verd Antique Marble. '20, 10; Hudson Marble. '23, 10; Barrel Quartz of Nova Scotia. il. '64, 10

TO
HORTICULTURAL
HALL

INDUSTRIAL ART EXHIBITION,
AMERICAN INSTITUTE EXHIBITION
MEMORIAL HALL.







JOHN SINKANKAS
5372 VAN NUYS COURT
SAN DIEGO, CALIF. 92109

